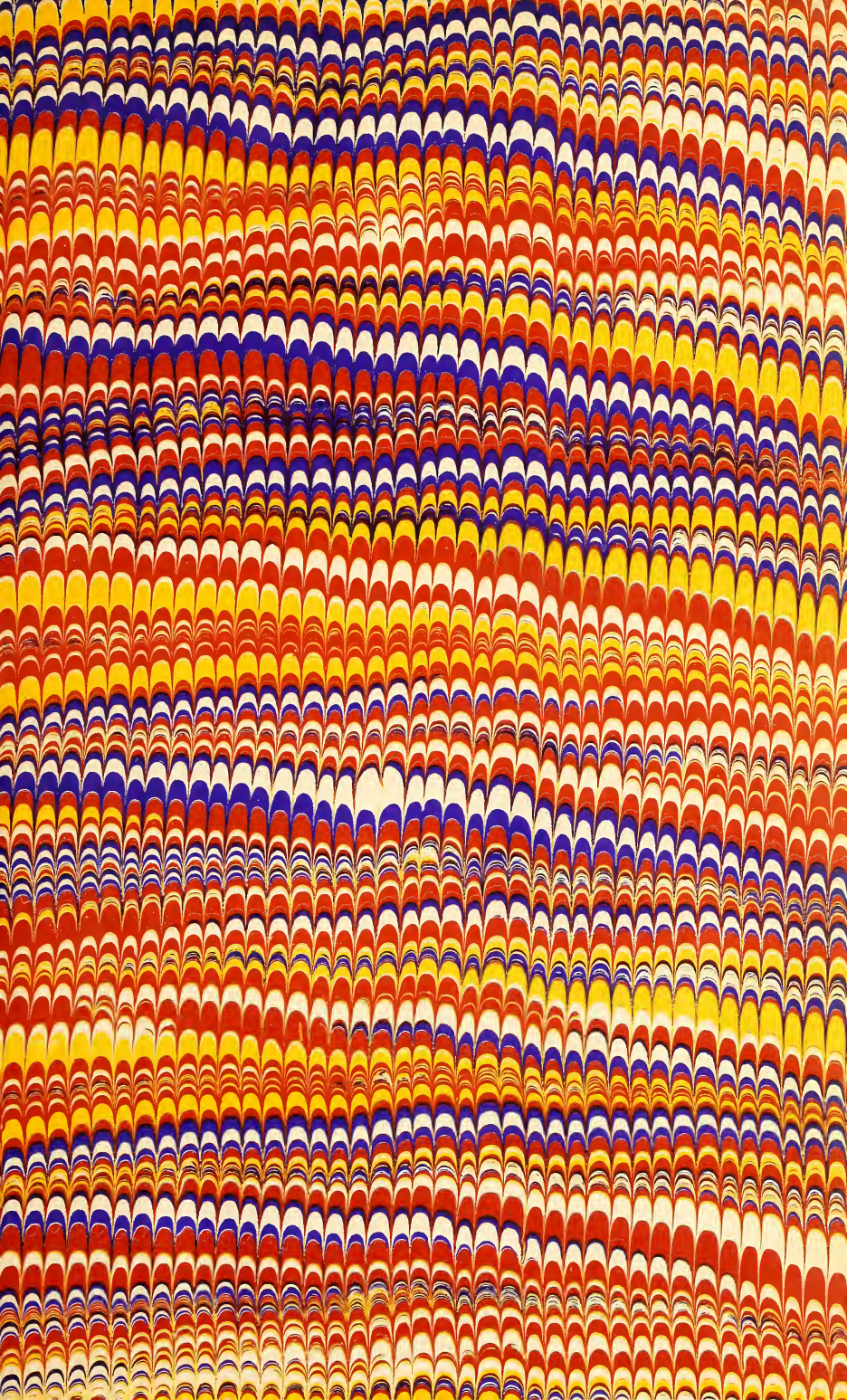

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THE

# NATURALIST:

A

MONTHLY JOURNAL OF

## *Natural History for the North of England*

EDITED BY

W. H. PEARSALL, D.Sc., F.L.S., and W. R. GRIST, B.Sc.,

THE UNIVERSITY, LEEDS.

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**1933.**

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# The NATURALIST

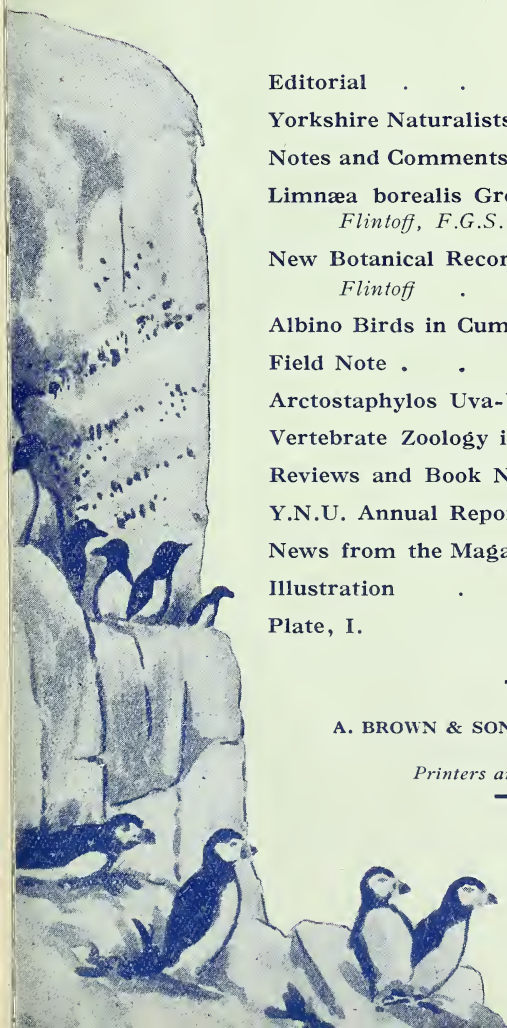
## A MONTHLY ILLUSTRATED JOURNAL

PRINCIPALLY FOR THE NORTH OF ENGLAND.

*Edited by*

W. H. PEARSALL, D.Sc., F.L.S., and W. R. GRIST, B.Sc.,
The University, Leeds.

SMITHSONIAN INSTITUTION
JAN 17 1933
NATIONAL MUSEUM



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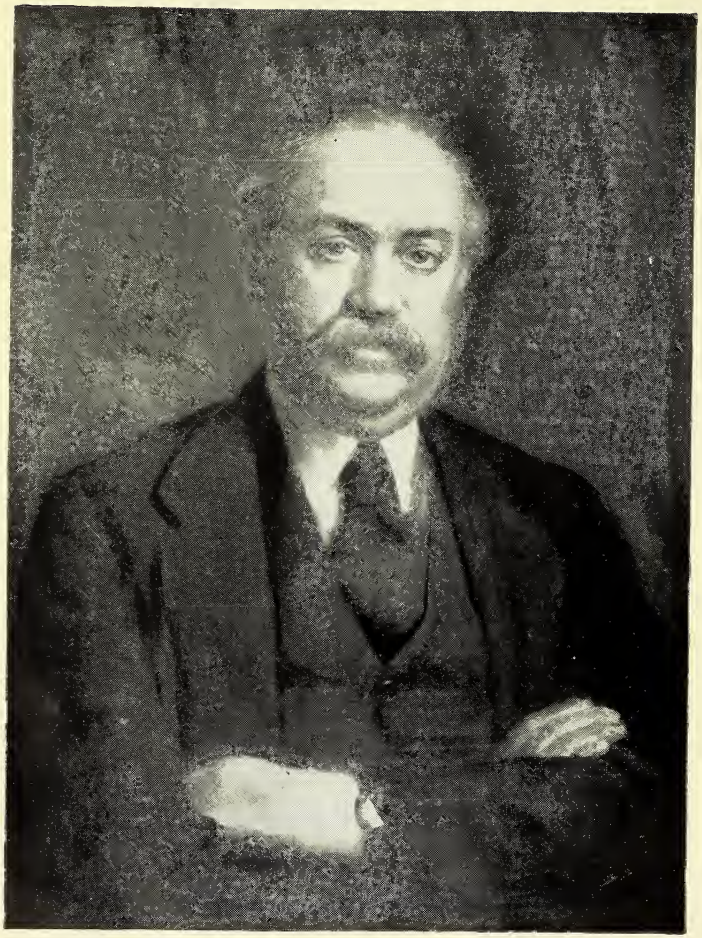


T. SHEPPARD, Esq., M.Sc., F.G.S., etc.,
Editor of *The Naturalist*, 1903-1933.

# THE NATURALIST

FOR 1933.

## EDITORIAL.

With the previous number, the long connection of Mr. T. Sheppard with *The Naturalist* as its Editor came to an end. Mr. Sheppard became Editor in 1903, and he has occupied this post continuously until the present. Naturalists in general and readers of this paper in particular certainly owe a very great debt to Mr. Sheppard, while it is impossible to estimate how much *The Naturalist* itself owes to his activities on its behalf. Not only was he responsible for bringing it to a high level of efficiency in the pre-war years, but he also successfully laboured to maintain its quality and style during the difficult war and post-war periods. He has succeeded in imparting to the journal something of his own vitality, and, still more, the impress of his own personality.

It is fitting, therefore, to say that the existence of *The Naturalist* is a monument to Mr. Sheppard's work, and the new Editors fully recognise that they are confronted with a considerable task in continuing the high standard of the journal set by Mr. Sheppard.

[*Note: The frontispiece is a reproduction of the oil-painting by Mr. Vincent Galloway, presented to Mr. Sheppard at Halifax, December 10th, 1932, on the occasion of his retirement from the Editorship of The Naturalist.*]



JAN 14 ...

## YORKSHIRE NATURALISTS AT HALIFAX.

The Seventy-first Annual Meeting of the Union was held at the Bankfield Museum, Halifax, on December 10th, 1932. Both the General Committee Meeting and that at which Prof. A. Gilligan, D.Sc., delivered his Presidential Address on ' Sand Grains and Sandstones,' were better attended than any similar meetings held for many years past. The Mayor of Halifax (Councillor Wm. Crabtree, J.P.) gave a warm official welcome to the Union, and expressed his best wishes for the continued success of its activities ; the appreciation of the Union shown by this public recognition was ably voiced by Prof. Gilligan.

An unusual item in the day's programme was a presentation made to a retiring official, Mr. Thomas Sheppard, M.Sc., who had been Editor of *The Naturalist* from January, 1903, until December, 1932. Prof. Gilligan, in asking Mr. Sheppard to accept a portrait of himself, painted by his friend, Mr. Vincent Galloway (City of Hull Art Gallery), spoke of his unremitting work in the interests of the Union since he first became a member in 1897. Mr. Sheppard had been Hon. Secretary, Editor, and President of the Union (1908). Prof. Gilligan also paid a special tribute to Mr. Sheppard for the enormous amount of work represented by the publication of his ' Bibliography of Yorkshire Geology,' which had placed geologists under a debt of gratitude for all time. Yorkshire Naturalists were highly appreciative of these many and varied services on behalf of the Union, and it gave him the greatest possible pleasure, as President of the Union, to hand Mr. Sheppard his portrait and a cheque representing the joint subscriptions of over a hundred individual members, as well as a number of the Scientific Societies affiliated with the Union.

Mr. Sheppard, in acknowledging the gift, said he was deeply touched by this recognition, and spoke of his early association with the Union and of the knowledge of the county he had gained by that means, as well as of the friendships he had formed among the scientific workers with whom he was thus brought into contact. Although he was resigning the Editorship on medical advice, it was his earnest desire that he might still keep in active touch with the work of the Union, and with the pages of *The Naturalist*, which were now passing into other hands.

In the evening members were entertained by the Halifax Scientific Society at a Conversazione. The Circle of Microscopy, under the direction of Mr. J. A. Wade, displayed exhibits illustrating the biological foundations of inheritance which proved very attractive and highly informative. Fine

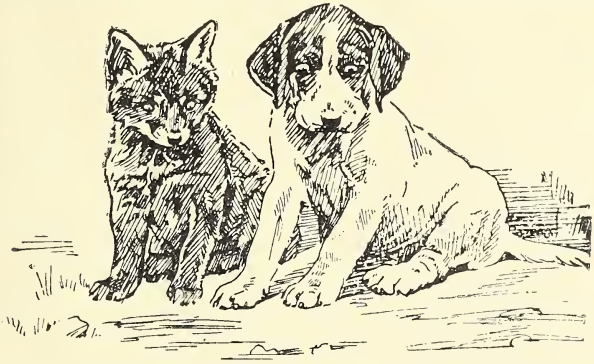
sections of coal balls and other specimens collected from the Halifax bed were shown, and an excellent table display of plants, plant galls, etc., illustrative of outdoor life in December was a very interesting feature among the exhibits.

It was announced that the President of the Union for 1933 would be Mr. J. M. Brown, B.Sc., F.L.S., while Mr. F. A. Mason and Mr. S. D. Persy Fisher had been re-elected Hon. Secretary and Hon. Treasurer respectively. The new Editors of *The Naturalist* were to be Dr. W. H. Pearsall F.L.S., and Mr. W. R. Grist, B.Sc., The University, Leeds.—F. A. Mason.

## NOTES AND COMMENTS.

MISS FRANCES PITT.[1]

This delightful narrative is surely the most charming of



the many publications from the pen of Miss Frances Pitt. Throughout its pages are touches of natural history interest, which, we are thankful to say, are inevitable, but the whole is a delightful story which is thrilling from cover to cover. The narrative relates to a young fox which was brought up and made friends with a baby hound, and they became quite playmates together. Eventually the fox escaped and took its home in the woods, until the day came when the foxhound took its place with the hunting pack. The hound discovered the fox, its former playmate, to the great joy and delight of both, and they gambolled about as in the old days. The story is written from the point of view of the fox, but is remarkable inasmuch as the author shows equal sympathy for both fox and hound. We are kindly permitted to reproduce one of the many delightful little sketches. In this case it illustrates the two ' inseparable companions.'

[1] *Scotty* : *The Adventures of a Highland Fox*, by Frances Pitt. London : Longmans, Green & Co., xii+271 pp., 10/6 net.

# *LINNÆA BOREALIS GRONOV.* IN NORTH YORKSHIRE.

R. J. FLINTOFF, F.C.S., F.L.S.

In John Gilbert Baker's *Flora of North Yorkshire*, 1906, page 314, I find: '*Linnæa borealis*, Gronov. Scottish type, Native, Montane, Area 3. Range, 250-300. Silpho Moor, between Scarborough and Whitby, discovered in 1863 by John Tissiman.' In *The Flora of Yorkshire*, by Henry Baines, 1840, I cannot discover any mention of *Linnæa*. In *The Supplement*, 1854, there is no record.

I have been investigating the matter for years and I am unable to find any trace of *Linnæa* on Silpho Moor, and more important, I cannot meet with any one who has, in spite of many observers having made diligent search.

Mr. Bernard Reynolds in his list of 'Whitby Wild Flowers,' 1915, gives two stations, Goathland and Hackness. Rare. The Hackness station has most probably been copied from Baker, and regarding the Goathland station all I can say is *Linnæa* is so rare here that I have not seen it, nor can I find anyone who has.

Canon Fisher in his list of 'Plants Twelve Miles Round Whitby, 1928, 1929, 1930,' omitted *Linnæa* on my suggestion, and no one has drawn attention to its having been left out of this record of local plants.

So far as I can learn there is no record for this plant either in the East Riding or the West Riding, so Mr. Tissiman's would appear the only one for the County of York, and the record is nearly 70 years old. We must, therefore, assume that no one has seen this plant during this long interval.

These questions arise, naturally: If Mr. Tissiman did not find *Linnæa*, what plant did he find, and is there any record of a dried specimen in any local or other herbarium.? I am writing this note in the hope that it may be the means of bringing forth some evidence in regard to *Linnæa* on Silpho Moor, and failing this the conclusion is surely warranted that *Linnæa borealis* is not a Yorkshire plant.

I wish to thank Dr. T. W. Woodhead, of Huddersfield, Mr. E. R. Cross and Mr. A. I. Burnley, of Scarborough, for their kind help, and Mr. A. E. Peck for very kindly making enquiries both in relation to *Linnæa borealis* and *Arctostaphylos uva-ursi*.

I have now drawn attention to four very doubtful records for the present time in Baker's *North Yorkshire*.

1. *Allium schoenoprasum* in meadows at Kirby Moorside in 1805, recorded by Mr. Flintoff.
2. *Arctostaphylos uva-ursi* in long ling on the hills between

Levisham and Cawthorne Camps, recorded by Dr. Braithwaite.

3. *Andromeda polifolia* at Balderdale, discovered in 1884 by W. Foggitt, of Thirsk, and A. Smith, of Durham.
4. *Linnæa borealis* on Silpho Moor between Scarborough and Whitby, discovered in 1863 by John Tissiman.

Unless we can glean some reliable information relative to these plants the records should be either omitted from a future edition of Baker's *Flora*, or a note appended stating that the plants are not known at these stations at the present time.

[*Oct 21st* 1932. Since writing the above I have had a visit to-day from Mr. A. J. Wilmott of the British Museum, and he tells me that in the herbarium there they have a specimen of *Linnæa* from Silpho Moor. Mr. Wilmott has very kindly promised to send me a copy of the label.]

## NEW BOTANICAL RECORDS FOR NORTH YORKSHIRE.

R. J. FLINTOFF.

In the summer of 1931 Mr. H. Furness, of Brompton, near Scarborough, brought to me a plant which he found in a pond at Brompton. As it differed from type I sent it to the late Dr. G. C. Druce, of Oxford, who named it *Veronica beccabunga* Linn., *f. submersa*. All the leaves were submerged and translucent.

In *The Naturalist*, October, 1931, I wrote about a certain *Hieracium* found in Riccaldale, Kirby Moorside, by A. I. Burnley, John Burnett, A. S. Lealman and R. J. Flintoff, which proved difficult to identify. It has now been named by Dr. K. H. Zahn, *Hieracium sagittatum* Lindeb., var. *subhirtum* (Hanb.)

In 1931 I found at Grosmont a *Taraxacum* growing on the old railway line, which has been named by Dr. H. Dahlstedt *Taraxacum brachyglossum* Dahlst.

So far as I can learn these plants are new records for the North Riding, and possibly for the County of York.

I shall be grateful to anyone who will give to me definite information relative to the occurrence of these plants in the County.

---

*The Pontefract and Castleford Express* for December 2nd contains a lengthy article by Mr. C. Marshall on Castleford's Museum, which has just been opened to the public. He writes :—' The Museums' Committee have endeavoured to get away from the old idea of a museum being a general repository for old junk, for they realize that stuffed birds and beasts with glassy eyes and wooden expressions are not instructive, and that the best way to study them would be by a visit to the Whipsnade Zoo.'

## ALBINO BIRDS IN CUMBERLAND IN 1932.

T. F. MARRINER.

ALBINISM has never been so common among our birds as in this year.

YELLOW HAMMER.—A pure albino recorded from the Eden Valley in February, and another in March near Plumpton village. These were both noted by reliable authorities. A third was seen in April, but was quite possibly one of those already recorded.

HOUSE-SPARROW.—Two on a farm near Carlisle in April. Each year, for about five years past, albinos have been bred on this farm ; a gentleman in Carlisle has in his possession one of the birds bred there in 1931. It is a beautiful specimen, soon took to the cage life, and has become a great pet. The farmer upon whose property the birds nest is very proud of the presence of the white sparrows, and no one is allowed to interfere with them.

CHAFFINCH.—I had under observation the nest of a chaffinch, built just inside the gate of a nursery garden near Carlisle. One of the five young, when feathered, proved to be an albino. I missed the date when the young actually left the nest, but saw them being fed by the parent birds on the trees.

The albino remained in the neighbourhood for some time, then gradually began to get further and further southward along the road. It proved to be a cock bird. It eventually found its way to the riverside and for a time created much interest by its appearance in the public park at Carlisle. Then it disappeared, but a white chaffinch was seen about three weeks later on the roadside a few miles south of Carlisle. I have no doubt it was the same bird.

In August a white chaffinch was seen near Penrith, a cock bird, and late in September a similar record came from Shap. The bird was probably migrating south, as some of our residents are known to do, for the winter. It will be interesting to note whether it returns north in the spring, if it should survive the winter and other dangers to which its rarity will surely subject it.

BLACKBIRD.—Though no all-white specimens have been recorded during the year, there have been several instances of piebald varieties, Out of a nest of five in the hedge of a Carlisle garden four were more or less white, and a nicely marked specimen, shot accidentally near Brampton, is now in the Hancock Museum, Newcastle.

STARLING.—Though not, strictly speaking, a Cumberland record, a beautiful albino form was taken just over the border in June. It is at present in the possession of a Dumfries fancier.

Common Snipe.—A perfect albino form appeared on the marsh near Bowness on Solway in September, and is now being kept under close observation by local bird lovers to preserve it, if possible, from the gunmen.

The above list only includes examples which I have either personally seen, or know to have been seen by a reliable bird man. Other instances have come to my notice, but as I was unable to verify either personally, or from a reliable source, I have not included them. For instance, jackdaws breed commonly in the cliffs at Penton, and a farm-hand tells me that a pure white bird came from one of the nests this year and was to be seen daily.

This may be quite correct, but I have had no opportunity of going to see it, and could find no one else who had actually seen it except my informant.

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## ARCTOSTAPHYLOS UVA-URSI Spreng., IN YORKSHIRE.

In reference to Mr. R. J. Flintoff's note in the December issue of *The Naturalist*, p. 374. Mr. A. E. Bradley writes : ' There is no mistake of identification in my Bearberry record, my father-in-law, Mr. T. R. Marsden, who was the " friend " referred to in the note, told me that Bearberry near Slippery Stones grew mixed with Cowberry. From the small bundle which he brought for me I selected two pieces which had a quantity of good foliage ; one of these I gave to Dr. F. A. Lees, the other piece is before me now, and I shall be glad to show it to anyone who is interested.

Mr. Ralph Chislett also writes : ' I can confirm that *Arctostaphylos uva-ursi* grows on the Yorkshire side of the Derbyshire Derwent, above Slippery Stones. I have known the locality long and well ; in spite of the attentions of the herbalists in 1900, the plant was abundant there in the spring of 1932.'

---

## FIELD NOTE.

**Grey Phalarope at Liverpool.**—In *The Naturalist* for June, 1932, I recorded the occurrence of two Grey Phalaropes (*Phalaropus fulicarius*) on the Cheshire coast at Dove Point, one of which was shot. It is interesting to note that another specimen was watched at Hoylake, near the same spot, on October 27th, 1932, after previously being reported to me by naturalists, sportsmen and the keeper from between Hoylake and Hilbre Island (Dee estuary). As far as I am aware the bird was not shot. It was frequently watched swimming and feeding on the edge of the water and afforded an admirable study subject for some of the ornithological section of the Liverpool Naturalists' Field Club.—Eric Hardy.

# VERTEBRATE ZOOLOGY IN YORKSHIRE.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held at Leeds, October 22nd, Mr. H. B. Booth occupying the chair.

The general and financial reports of the various Sub-Committees were approved.

Mr. Rosse Butterfield was elected to the chair for the coming year and Mr. E. W. Wade was nominated as the Section's candidate for the Presidential Chair of the Union.

## EXHIBITS.

Mr. C. F. Proctor exhibited the dried body of a Kestrel, taken from a keeper's gibbet at Hornsea, in which a Wren had built its nest.

Mr. F. H. Edmondson showed the skin of a Grey variety of Partridge, shot at Scorby ; a similar specimen was obtained at the same place two years ago. Mr. C. F. Mason exhibited part of the jaw and the overgrown incisor teeth of a hare in which the milk teeth had persisted and deflected the adult teeth out of contact with those in the opposite jaw.

## BIRD LANGUAGE.

Mr. W. R. Grist read a paper on ' The Study of Bird Language,' and stated that although the songs of birds had interested mankind from the dawn of civilisation, the failing of the older school of observers was to argue too anthropomorphically. Actually the structure of the brain of a bird is very reptilian in character, although the bird is warm blooded. This fact, coupled with other observations, suggests high development of instinctive behaviour and limited intelligence. Thus, nest building and migration appear to be governed by instinct rather than by intelligence.

The sense of smell is undeveloped but hearing is acute and communication is by sound, usually vocal. The whole of the ear, including the mechanism of balance, is highly developed.

The sounds produced by birds may be divided into two main classes ; the call note which express alarm, brooding, feeding or gathering, and the song, which may be defined as a sustained sequence of notes arranged in a recognisable specific pattern. Thus the songs of the Chaffinch, Thrush or Robin may vary individually and yet be instantly recognised as specific.

Birds living in colonies do not sing, but those species scattered over the countryside have each their own song. A series of charts, compiled by Mr. Walter Gyngell, in the Scarborough district, were circulated and indicated the song cycles of a large number of species throughout the year. It was clearly shown that the greatest activity coincided with the middle of the nesting season, and as the birds are then mated it is clear that the purpose is not to attract a mate but rather to assert a territorial right during a period when the young are defenceless.

Various means were described by which a knowledge of bird songs could be acquired and the lecturer cleverly imitated a number of bird songs by means of mechanical contrivances and by whistling. Various methods of recording the songs were also explained and examples were read from various works on British Birds to illustrate the extreme difficulty of indicating correctly the song of a bird in print. Gramophone records provided a promising field, but the high cost raised a real difficulty at the present time.

The lecturer enumerated many problems awaiting solution and thought that time-tables for the day and year were urgently required. It was also important to determine if mated cock birds sing more or less

than unmated birds of the same species. Some, such as the Starling, are known to mimic the songs of other species. Then again, is there evidence that young birds find it necessary to practise before they become song perfect?

### Life of the Heron.

An illustrated paper was then read by Mr. H. J. Wagstaff, on ' The Home-life of the Heron as seen through eight Breeding Seasons.' The lecturer stated that the photographs had been taken and the observations made in a very ancient and carefully preserved Heronry, on an island site in one of the Midland Counties. The nests, particularly the older ones, were of great size, sometimes as much as nine feet deep, and built of sticks up to six feet in length. In a second Heronry near by, the lining was of smaller twigs and of dried grass. The trees were well grown and the construction of ' hides ' at a height of about 85 feet presented unusual difficulties. The framework was of timber secured by galvanised wire and covered with a water-proof fabric.

The presence of the birds in the tree tops indicated the selected sites of future nests and a certain ceremonial accompanied the actual building of the nests in which both birds participated. Certain peculiar notes were uttered by the male on presenting a stick to the female and she, before receiving it, threw back her head and touched her tail with the tip of her beak. Some nests were built very rapidly, often with stolen material.

The first egg was laid soon after the completion of the nest and the full complement varied from three to five. Both birds took turns at incubation but the female sat for longer periods, until after 26 to 28 days, the young were hatched. The eggs were frequently inspected at this stage and the pieces of egg shell were carefully removed.

When disturbed, the parents frequently left the nest for seven or eight hours and were unusually timid on returning. It frequently happened that the young were not fed for very long periods and it appeared certain that food was brought during the hours of darkness. It was, therefore, decided to improve the ' hide ' so that it would be possible to remain in it for the entire week-end without the observer suffering unduly from the cold winds which were much in evidence in such exposed situations during the early months of the year.

When the young were 10 to 14 days old, they were not brooded so much and the adults disgorged half-digested food into the bottom of the nests when a scramble took place ; the food consisted of rats, mice, moles, lizards, fish, beetles, and young birds. At the age of three weeks, the young were excitable and noisy and the parents, on landing at the side of the nests, commenced to rock themselves backwards and forwards until a thickening of the neck indicated that food was about to be disgorged into the nest. The young then stretched up and seized the beak of the adult, dragging the head down into the nest. Feeding took place through the night and the whole family rested at dawn.

Four or five disgorgings might be made at one visit to the nest and the adult did not concern itself in the least with the distribution of the food. On one occasion, a carp of about two lbs. weight was disgorged and the young struggled for possession until they were all too exhausted to continue. Not infrequently a tug-of-war took place over the body of of a rat or rabbit. After feeding, the fish scales were removed from the beak by means of the comb on the middle toe.

As the young grew older they grasped the bottom of the nest and indulged in wing exercises ; at other times they amused themselves by dexterously catching the flies that invaded the nest. Later still, they climbed out on the branches to practice wing exercises, jumping from branch to branch as their confidence increased.

The lecturer referred particularly to the position of the eyes of the Heron which are set to look downwards so that the area beneath the head can be seen when the beak is held horizontally and to the long yellow tongue which could be clearly seen in some of the photographs.

When stormy weather was experienced, the young squatted down in the bottom of the nests, and when the sun shone, much time was given over to preening and sun-bathing. When heavy rain fell, the young wrapped themselve about with their wings in a most remarkable manner, the head and neck being completely hidden. When the rain ceased they opened their wings, shook themselves and appeared to be quite dry.

In many of the nests one of the young was smaller and weaker than the others and obtained a smaller share of the food. This hindered its growth and placed it at a further disadvantage of which the others took immediate advantage. It received violent stabs and buffetings from the others until it learnt to interpose its body and to hide its more vulnerable head and neck. As it became weaker it was more and more assailed by the others until it was finally killed or pushed over the edge of the nest. This accounts for the large number of young Herons found dead or dying beneath the nests and it was observed that the adults treated the matter with complete indifference.

The Heron mates when two years old and does not appear to rear a second brood.

The lecturer had to dispute the tenancy of his hide with a pair of amorous Stock Doves and a pair of Jackdaws which frequently perched about his person. The lecture was admirably illustrated and was much appreciated as the culmination of an enterprise displaying both enthusiasm and endurance.

A vote of thanks to the lecturers and the lanternist was proposed and carried unanimously.

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## REVIEWS AND BOOK NOTICES.

**The Nightingale: Its Story and Song,** by **Oliver G. Pike.** London: J. W. Arrowsmith, Ltd., 208 pp., 10/6 net. The author seems to have gathered together all there is to be said about the Nightingale, its nesting habits, its song, food supply, etc. His notes thereon are followed by eighteen chapters dealing with Warblers, Thrushes, Finches, Skylarks, Titmice, Pipits, etc. The species described are illustrated by quite good photographs reproduced by the half-tone process, and there is no doubt our readers will like to have this record of observations which they have probably made in the field.

**Thomas Johnson: Botanist and Royalist,** by **H. Wallis Kew** and **H. E. Powell.** London: Longmans, Green & Co., Ltd., xi.+151 pp., 8/6 net. The work of the pioneers of botanical science are often so hidden and difficult of access that we are inclined to forget the work of these great writers. Our contributor, Mr. H. W. Kew, together with the Librarian of the Royal Society of Medicine, Mr. H. E. Powell, have jointly made investigations as to the life and work of Thomas Johnson, who early contributed much to botanical science. The list of works and references with which the volume commences is rather an alarming one, and shows the extent to which research has been made. Perhaps one of the most remarkable of many illustrations is that on Plate XI. when it is shown to what an extent England and Wales was covered by Johnson during his botanical work. There are reproductions of photographs, early books, woodcuts, etc., the whole making an entertaining volume. Among them is an early example of a bunch of bananas

which was received in 1633. They were then known as ' Plantaine Fruit.'

**Upland Rambles in Surrey and Sussex,** by **Harold Shelton.** London : Pitman & Sons, Ltd., 126 pp., 3/6 net. In company with his mother, the author has explored the more interesting and delightful parts of Surrey and Sussex, and in twelve chapters gives an account of the routes travelled. There are illustrations of the topographical features, and ten route maps. The three appendices give an idea of the time spent in the district, namely : ' A Week's Walking in the North Downs ' ; A Week's Walking in the South Downs ' ; and ' A Fortnight's Walking in Surrey and Sussex.'

**The Lake Counties,** by **W. G. Collingwood.** London : F. Warne & Co., Ltd., xvi.+368 pp., 15/- net. This volume was published within a few days of the death of the author, whose work in the Lake District is well known. It appeared in pocket form over thirty years ago and has long been out of print. The book has been entirely revised and considerable additions have been made, all of which received the author's personal attention. There are no fewer than sixteen plates in colour and seventy-two line illustrations, by A. Reginald Smith ; and there are special articles on ' The Birds,' by Mary L. Armitt, revised by Arthur Astley ; ' Butterflies and Moths,' by Dr. R. C. Lowther ; ' The Flora,' by S. L. Petty, revised by Mary Thompson, Agnes Drury and A. G. Hayes ; ' The Building of the Lake District,' by B. Smith, etc. The name of Collingwood is too well known to our readers to require any recommendation, but we should like to congratulate the publishers on their splendid share in the work. There is also a useful Gazetteer.

**The Psychology of Animals,** by **F. Alverdes.** London : Kegan Paul, Trench, Trubner & Co., viii.+156 pp., 9/- net. This is one of a large number of volumes in the International Library of Psychology, Philosophy and Scientific Method, edited by C. K. Ogden, M.A. ' The interest of humanity in animal psychology is very ancient. While biology has kept to the view that animals (and even men) are machines, and that animal psychology is unthinkable, the " commonsense " view that animal behaviour can be interpreted by human beings is equally strong. Dr. Alverdes, in this interesting work, comes down in favour of the " commonsense " viewpoint. Ranging over a wide field, he shows how the psychological attitude to animal behaviour may be used to guide and interpret experiment.' The titles of the first four of the twelve chapters give an indication of the thoroughness of the work, namely : ' Difference between living and non-living nature—The " End " (aim, object, purpose, goal) and the " Whole " as biological fictions—" The End determines the Means," and " the Whole determines the Parts " ' ; General remarks on scientific statement, and more concerning the fictional mode of regarding biological facts.—Consciousness, freedom of will, psyche ' ; ' Individuality—The ciliated slipper-animalcule as individual ' ; ' More concerning the individuality of animals possessing numerous like organs of locomotion.—The free-swimming Turbellaria and Starfish.' The volume has been translated by Dr. H. Stafford Hatfield.

**The Roads of England,** by **R. M. C. Anderson.** London : Ernest Benn, Ltd., 240 pp., 8/6 net. This is a fascinating record of the growth and evolution of the roads of England and of the way in which traffic thereon has improved from the date of ' Shanks's Pony,' coaching days, etc., to the present time, when so many of the roads have had to be rebuilt on account of the change in the traffic. The old road books, turn-pike roads, toll-bars, etc., all come under the reviews.

# THE YORKSHIRE NATURALISTS' UNION'S SEVENTY-FIRST ANNUAL REPORT FOR 1932.

**(Presented at Halifax on Saturday, December 10th, 1932).**

**The Seventieth Annual Meeting** was held at Skipton on Saturday, December 5th, 1931. The Annual Report was published in *The Naturalist*, pp. 23-30, 56-60 and 87-92.

**The Presidential Address,** on 'British Entomogenous Fungi,' was delivered by Mr. T. Petch, B.A., B.Sc., and that also has been published in *The Naturalist*, pp. 103-108, 133-136 and 167-172.

**The Secretariat.**—The resignation of Dr. W. H. Pearsall, F.L.S., as Joint Hon. Secretary, from December 31st, 1931, on account of the work entailed by his appointment as Hon. Director of the Freshwater Biological Research Laboratory, Windermere, was accepted with regret. Dr. Pearsall had been in office since the beginning of 1922, and the Executive wishes to place on record its high appreciation of his many valuable services. Mr. F. A. Mason, who was elected Hon. Secretary for 1932, expressed his keen regret at the severance in office. Dr. Pearsall and he had worked throughout a period of ten years with the most cordial co-operation ; in the Field and in the Executive business of the Union alike, Dr. Pearsall's services would be greatly missed, and he had the best wishes of the Union for the success of the work in which he is now engaged.

**The Presidency for 1933** has been offered to and accepted by Mr. James Meikle Brown, B.Sc., F.L.S., F.E.S., in recognition of his services to Entomology and to other branches of Natural History, and particularly in respect of his contributions to Yorkshire Entomology.

**Field Meetings** have been held during 1932 as follows :—Conisborough (for Don Gorge), Saturday, April 30th ; Sedbergh (for Howgill), Whitsun, May 14th to 16th ; South Cave, Saturday, June 18th ; Salburn, Saturday, July 2nd to 4th ; Skipton (for Gargrave), Bank Holiday, July 30th to August 1st ; Fungus Foray, Kirby Moorside, September 17th to 21st, and reports of the general excursions have appeared in *The Naturalist* during the year ; the report of the Fungus Foray is in the Press. In addition there have been Sectional Field Meetings for Entomology and Plant Galls, at Ryhill, June 25th ; Conchology, at York, June 11th, and Kirk Smeaton, September 10th ; Ecology, Moughton, May 7th.

**The Excursions for 1933** will be as follows :—

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| April 15th-17th (Easter) ... | ... Robin Hood's Bay (N.E.) |
| May 13th (Saturday) ... ... | ... Skipwith (S.E.) |
| June 3rd-5th (Whitsun) ... | ... Dent (N.W.) |
| July 8th (Saturday) ... ... | ... Ripponden (S.W.) |
| August 5th-7th (Bank Holiday) | ... Ripon (Mid.W.) |
| September 16th-21st ... ... | ... Fungus Foray, Barnard Cartle (for the Yorkshire side of the Tees). |

**Change of Address.** The following changes (or corrections) have been notified during the year :—

Bradford Natural History and Microscopical Society : Hon. Secretary, W. F. Fearnley, Arvensis, The Drive, Ben Rhydding.

Bradford Scientific Association : Hon. Secretary, Oswald J. Harding, 76 Pasture Lane, Clayton, Bradford.

Bromehead, C.E.N., B.A., Geological Survey Office, 32 St. Mary's, York.

Darlington and Teesdale Naturalists' Field Club : Hon. Secretary, J. B. Nicholson, M.A., "Elmstead," Elms Road, Darlington.

Falconer, Wm., F.E.S., 25 Ashdale Road, Waterloo, Liverpool.
Hincks, W. D., M.P.S., "Sudest," 46 Gipton Wood Avenue, Harehills, Leeds.
Dixon, W. L., 7 Manby Road, Sudden, Rochdale.
Montagu, Miss A. E., "Low Borrans," Windermere.
Petch, T., B.A., B.Sc., North Wootton, King's Lynn.
Simpson, J. R., Longden Avenue, Dryclough Road, Crosland Moor, Huddersfield.
Taylor, E. Wilfred, 13 Chestnut Avenue, York.
Versey, Dr. H. C., F.G.S., 1 Stainburn Terrace, Moortown, Leeds.
Wade, E. W., "Ferriby," St. Osmund's Road, Parkstone, Dorset.

**Membership.**—The following new members have been elected during the year, making a total of 326 :—

Akers, Noel C., F.I.C.,.Cliff Edge, Hornsea.
Boyne, Dr. A. M., 48 Park Grove, Prince's Avenue, Hull.
Burkill, Harold J., M.A., F.R.G.S., 3 Newman's Court, Cornhill, London, E.C.3.
Cowling, E. T., Gay Lane, Otley.
Gray, R. W., 8 Hartley Road, Exmouth.
Hall, Miss Margaret J., "Mannville," Cottingley Drive, Bingley.
Holroyd, George E., F.Z.S., Cardrona, Baildon.
Oliver, F. W., Sablecote, Hornsea.
Stubbs, Fred B., 80 Spring Lane, Oldham.

**Affiliated Societies** remain at 38 in number. The Hon. Secretaries of certain Societies have failed to furnish particulars of their Membership and of their circular requirements, and it is in the interests of their respective Societies that this should be done. Prompt attention to the requests of the Hon. Secretary of the Union in this connection would greatly facilitate the work of the Executive and would tend to encourage more enthusiasm in the interest taken in the activities of the Union by the Associates.

**Obituary.**—The Union deplores the loss, through death, of Jo. Beanland, Ben Morley, Bernard Hobson, F. J. Stubbs, G. H. T. Newcommen, T. H. Taylor, and G. C. Waud.

**Permanent Members of General Committee.**—The following members have been elected :—

Miss L. M. Anderson, Miss L. Scott, Miss D. Wooff, C. Allen, W. B. Haley, E. Hallowell, Chas. Mosley, T. Throup.

**Honorary Members.**—Mr. F. W. Bramson, F.S.C., an Mr. M. H. Stiles, F.R.M.S. are elected Honorary Members.

## VERTEBRATE ZOOLOGY SECTION.

**York District** (Sydney H. Smith, F.Z.S.) :—Ornithological Notes.—Nesting operations of wild bird life were retarded by the cold weather of March, April and May ; gales of wind accompanied by cold rain and sleet were the daily obstacle of summer immigrant birds, and as late as May 4th there was a heavy fall of snow in the evening, and floods in the Rivers Ouse and Derwent and other tributary streams. Many species of birds had their nests destroyed, the greatest sufferers being Grouse, Partridges, Wild Duck, and various other water-frequenting fowl. Later on, however, the weather cleared up and second nests were attempted, and in many cases with reasonable success. The general effect is disastrous because only a small percentage of birds whose nests are thus destroyed will essay the task again the same season.

The usual colony of Black-headed Gulls occupied the ponds at Skipwith Common and appeared to be about the same in number as last year. There were a fair number of Mallards nesting there, also several pairs of Shoveller and Teal Ducks, and two pairs of Nightjars made use of an old haunt in the bracken.

Three pairs of Nightjars nested successfully at Sandhutton, and others were noted at Strensall and at Scoreby.

Two nests of Blackcap Warbler were found at Sandhutton and the young hatched safely; both nests were photographed by Mr. F. Vear, who states they are the first Blackcap Warblers he has seen there for several years.

The same observer found six nests of the Tree Creeper at Sandhutton, but states that two were destroyed by the heavy rains; the species is rare in the vicinity of York, and I hope this note indicates a probable increase of such an interesting bird.

Mr. Vear also reports finding the nest of a Song Thrush built on the ground in a plantation at Sandhutton, and a nest of the Chaffinch built in the side of a haystack at the same place—both are most unusual situations.

A Nightingale frequented the lane leading to Waplington Hall, near Pocklington, and was singing every evening during June.[1]

Cuckoos have been fairly numerous, although late in arriving; during July a young Cuckoo being fed by a pair of Pied Wagtails had been reared in the grounds of Allerthorpe Hall, where it was watched over by Alderman H. Rhodes Brown, J.P. (Lord Mayor of York) and his lady.

Corncrakes have been very scarce; one pair was noted at White Sike Farm, Sandhutton, by Mr. Vear early in May, and this is the only record sent to me.

Six pairs of Herons nested in the Shire Oak Woods at Healaugh, but do not increase in number.

Lapwings are fairly common, thanks to the protection of the Wild Birds Acts, and they would increase further if their nests were not destroyed by farmers' rollers on newly seeded arable land in the spring; this destruction appears to be unavoidable.

Mr. V. G. F. Zimmermann informs me that during the last week in February three pairs of Great Crested Grebes returned to the ponds at Dringhouses, York, after being absent through the winter. At the same time and place two pairs of Pochards were seen; these latter birds were noticed several times during the spring, and Mr. H. Shorney believes they bred in Askham Bogs.

The eggs in the Great Crested Grebes' nest on Mr. Hesp's pond were taken by some boys on May 8th. On May 25th there was a young Great Crested Grebe on Mr. Leetham's pond and two young ones on Mr. Hepper's pond; also the pair which had their eggs taken on May 8th had built another nest in the centre of Mr. Hesp's pond and were sitting on three eggs.

During the latter part of February there was a very large flock of Brambling Finches feeding on beech-mast in the wood between Terrington and Castle Howard, and several small flocks were noticed near Crambe Beck and the Castle Howard Farm School.

Curlews were often seen on Strensall Common and Alne Moor during the spring and summer, but I have no evidence that they bred there.

Mr. Zimmermann, in his report to me, also states:—

'On June 5th I saw a male Stonechat on Gilling Moor, and on the two following days I again saw it in the same place; evidently its mate was sitting somewhere near, as on July 10th I saw a pair of Stonechats and three young ones in the same locality.

'On June 19th I saw a Reed Warbler's nest with four eggs at Nidd; the nest was built amongst some reeds in the side of the lake.

'The same evening I heard the call of the Landrail near Ripley, also at Green Hammerton—the only times I heard the Landrail this year. Mr. H. Shorney informs me that the only time he heard it was near Bishopthorpe on May 18th.

'During the last week of September and for a few days in October

[1] ? May (H.B.B. & Ed.).

a small flock of about twenty Mealy Redpolls were to be seen every day feeding on some waste land near the River Foss at Huntington.

' Carrion Crows and Magpies appear to be more numerous than ever.

' On September 27th I saw a large flock of Fieldfares near Storwood ' —an early date of arrival of these Scandinavian winter visitors. (S.H.S.)

I must again express my gratitude to Messrs. V. G. F. Zimmermann, Fred Vear and H. Shorney for their valuable help in compiling these notes.

Arrival of Migrants, York District, 1932.

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| Chiff Chaff ... | Hawnby, March 13th ; Huntington, April 3rd. |
| Wheatear ... ... | Strensall Common, March 17th. |
| Willow Warbler ... | Stamford Bridge, March 15th ; Huntington, April 12th. |
| Sandpiper ... ... | Pickering, April 9th ; Hawnby, May 1st. |
| Swallow ... ... | Huntington, April 9th ; Stamford Bridge, April 15th ; Brandesburton, April 24th. |
| Sand Martin ... | Huntington, April 12th ; Stamford Bridge, April 15th, April 28th (12). |
| Cuckoo... ... ... | Huntington, April 26th ; Stamford Bridge, April 29th ; Boston Spa, April 29th ; Hawnby, May 1st. |
| Whitethroat ... | Huntington, April 27th. |
| Sedge Warbler ... | Huntington, April 27th ; York, April 28th. |
| Tree Pipit ... ... | Huntington, April 27th ; Dringhouses, May 8th. |
| House Martin ... | York, April 28th. |
| Blackcap ... ... | Sandhutton, April 28th. |
| Pied Flycatcher ... | Hawnby, May 1st. |
| Whinchat ... ... | Strensall, May 3rd. |
| Corncrake ... ... | Sandhutton, May 2nd. |
| Swift ... ... ... | Huntington, May 3rd ; York, May 6th. |
| Nightjar ... ... | Gilling, May 3rd ; Sandhutton, May 6th. |
| Turtle Dove ... | Ampleforth, May 3rd ; Strensall, May 8th. |
| Yellow Wagtail ... | York, May 6th ; Dringhouses, May 26th. |
| Redstart ... ... | Huntington, May 6th. |
| Spotted Flycatcher | Huntington, May 6th. |
| Reed Warbler ... | Dringhouses, May 8th. |
| Garden Warbler ... | Dringhouses, May 8th. |
| Grasshopper Warbler | Askham Bogs, June 19th. |

Pisces.

(Sydney H. Smith, F.Z.S.) :—The period under review has not yielded any fish that are really exceptional, and local anglers have not contributed a single specimen worthy of setting up as an addition to the very fine collection of the York and District Amalgamation of Anglers. The rivers generally have run in normal volume, except for a few minor floods during April and May, such floods really being an advantage from an angler's point of view. The item of outstanding interest is the remarkable run of salmon in the lower Ouse during August ; upwards of 1,000 fish were obtained by the various netsmen who operate on this length. This is curious in view of the corresponding scarcity of Salmon along the East Coast of Yorkshire at this period. Last year record catches were obtained along the coast, and this synchronised with a fairly plentiful supply of Salmon in the River Ouse, and I am at a loss to understand the reason why 1932 should be marked by record numbers in the river and record decrease on the coast. The *Yorkshire Evening Press* of August 16th reported a 12 lb. Salmon as having marooned itself by jumping amongst the rocks below the fall at Naburn ; this fish was rescued by spectators and returned to safety. On August 3rd a large fish, supposed

to be a Salmon, jumped below the weir at Topcliffe in the River Swale. The river was in slight flood and the water temperature 57 deg. F. Numbers of Salmon were passing up the ladder and also jumping at the fall at Linton-on-Ouse on September 3rd, the fall at this time being nearly drowned by flood water. Perhaps the most interesting item concerning Salmon is the reported capture on July 11th of two Salmon parr (yearling Salmon) at Langton in the River Swale, by Mr. Smithson, of Northallerton, who duly returned the youngsters to the water. These fish obviously must be the result of naturally deposited ova of the previous season's run, and goes to prove that some Salmon must, on occasions, be able to get over the supposed insurmountable barrier at Topcliffe Weir.

Salmon.—Since writing this report I am informed that on October 11th there was a continuous run of Salmon all day over Naburn Weir. The weir was almost drowned by a freshet coincident with a high tide, which brought the two levels within 2 feet of each other. The lock keepers state that many hundreds of Salmon surmounted the dam.

Trout.—The River Derwent in the vicinity of Malton has yielded several large Trout, the best weighing nearly 8 lbs., and several others of a little over 5 lbs. have been caught, principally with the aid of live bait. Fishing the Holbeck, near Slingsby, on July 3rd, I had Trout $2\frac{1}{4}$ lbs. and $1\frac{1}{4}$ lbs., and friends had three more Trout each $1\frac{1}{4}$ lbs., all taken on minnow. The Trout fishing season generally has been an average one, and no catches of outstanding interest are reported. An experiment has been the stocking of the lake at Waplington, near Pocklington, with 250 yearling and 2,000 Trout fry, all of which were turned in on July 9th. The lake is some 5 acres in extent and shallow in depth, being densely overgrown with waterlilies. On July 17th, six yearling Trout were found dead, very probably killed by rotting vegetation, the result of cutting the waterlilies. Since that date, however, no more dead fish have been seen.

Grayling.—A large number of grayling, netted from the River Costa, were liberated in the River Nidd at Skip Bridge on February 2nd, 1932 ; fifty of these, from 12 inches to 15 inches in length, were marked by me with silver numbered tablets previous to their release. Seven of these fish have since been recaptured at points varying from half a mile to $3\frac{1}{2}$ miles from the place of their introduction. Full details will appear in the next Yorkshire Fishery Board report. On July 19th a Grayling, 1 lb. $5\frac{3}{4}$ ozs., was caught in the River Nidd at Hammerton by Mr. G. Ward.

Pike.—Pike are generally numerous in the Rivers Ouse, Derwent, Rye and Swale, and reports of their capture have been numerous, but there have been no fish of this species of specimen size. On January 17th, Mr. F. Dyer, of the York City Rowing Club, found a pike stranded after flood on the bank of the River Ouse at Clifton, York, which measured 3 ft. 7 ins. long and was 7 ins. across the back and would be well over 20 lbs. in weight. This fish still shewed signs of life, and after being lifted into the water it gradually recovered and went away.

Common Eel.—Two large specimens have been obtained ; in September one weighing 6 lbs. 4 ozs. was caught at a place called Queen Mary's Dub, a large sheet of water about three miles from Ripon. This lake is not far from the River Ure, and eels will be able to get to it fairly readily. Another weighing a little over 5 lbs. was caught at Linton-on-Ouse, also during September.

Lamprey.—On April 27th large numbers of Lampreys were running up the Isle Beck, in the vicinity of Thirkleby. Mr. G. Merriman, of York, caught twelve on this date in his landing net and returned them again to the water. Lampreys were also reported about this date as being seen in both the rivers Ouse and Derwent. Those reported from the

Isle Beck must have come up the Rivers Ouse and Swale and Cod Beck before arriving in the Isle Beck on their spawning errand.

Burbot.—A feature of the River Derwent in the vicinity of Elvington has been the occurrence of Burbot Eels during August and September; anglers caught twelve Burbot weighing up to 1 lb. each during the last week of September. The Burbot used to be very common in the River Foss at York thirty years ago, but appears to have now entirely disappeared from that river.

Flounder.—Numbers of Flounders have been taken in the River Derwent below Sutton dam during September, and one specimen weighing 15 ozs. was caught in the River Nidd at Hammerton early in October.

Barbel.—A number of Barbel have been obtained in the Rivers Ouse and Wharfe during the year, but the item of most interest is the capture of a young Barbel 7 ins. long in the River Foss between Yearsley Bridge and the Union Workhouse on October 16th by Mr. William Dodds, of York. This fish was brought to me alive, and is being kept in my aquarium for further observation. I have never previously known, during a period of thirty years, of the occurrence of the Barbel in this tributary of the River Ouse.

Roach.—The River Ouse in the vicinity of Acaster has produced a good number of Roach during the year, probably as the result of continued stocking by the York Angling Clubs. One specimen fish weighed $1\frac{1}{2}$ lbs., and this was reported as having been taken near Fulford.

Perch.—Many hundreds of Perch have been introduced into the River Ouse by the York and District Amalgamation of Anglers, but it is curious that this species does not become very firmly established. I believe the explanation to be lack of suitable spawning places; Perch ova is produced in long strings and requires to be interlaced amongst subaqueous grasses and water-loving plants, and a lack of such accommodation may explain the position in regard to this fish. A specimen weighing $15\frac{3}{4}$ ozs. was caught in the River Wharfe at Tadcaster by Mr. W. Lee on July 19th, and another 1 lb. $1\frac{3}{4}$ ozs. was caught in the River Derwent at Bubwith by Mr. W. Spindley on the same date.

Ruffe.—Mr. D. Langstaffe draws my attention to a remarkable feature of the Lower Ouse, the permanent stock of Ruffe; during the year many thousands have been killed by local anglers, but the supply seems to be as great as ever. Mr. Langstaffe suggests there must be something peculiar in the manner of their spawning which permits them to become so firmly established, and I commend the subject to our local biologists for special study.

Gudgeon.—Another noticeable feature of the Lower Ouse (the Naburn and Acaster areas being indicated) is the increase in numbers of Gudgeon, most of them of large size. Mr. Langstaffe states that many years ago they were very plentiful in the River Ouse and then became very scarce. On one occasion some years ago a local angler (F. Henderson) won a fishing match with a catch of 8 lbs. of Gudgeon numbering 120.

Chub.—There is nothing to report in respect of Chub.

Dace.—There have been some good catches of Dace in the River Ouse and Isle Beck, but none of specimen weight.

Bleak.—This fish is extraordinarily numerous in both the Rivers Ouse and Foss, and affords much sport, particularly to juvenile anglers.

**North Riding** (W. J. Clarke, F.Z.S.):—Marine Fish.—Observations on fish have been mostly confined to the Scarborough Fish Market, where some interesting specimens have been landed during the year. On June 2nd, 1932, a Red Mullet was brought in, an uncommon fish in this district. A Black Bream was trawled 12 miles E.N.E. off Scarborough on January 26th. Two Red Gurnards were observed among the heaps of the commoner Grey species on January 11th, 1932. Tunnies were abundant off Scarborough during the summer, the first being seen on August 6th, 1932. Between that date and September 17th fifteen of

these fish were caught off Scarborough at distances varying from 4 miles to 30 miles from the shore. The weights ran from 434 lb. up to 798 lb. Six tunnies were also caught near Whitby, from 538 lb. to 700 lb. in weight. A fine example of the rare Wolffish, *Anarrhichas latifrons*, measuring 3¼ ft. in length and 28½ in. in girth, was caught by the S.T. *Brilliant Star* on August 17th, 1932, 24 miles E.N.E. off Scarborough. It was sent to the British Museum, where an examination of its stomach revealed that it had been feeding upon pollack. This is, I believe, the fourth record for the North Sea.

An hermaphrodite Cod, containing both roe and milt, was trawled 20 miles off Scarborough on March 24th, 1932. Two Halibut of unusual size for the North Sea, were caught on a line within 5 miles off Filey Brig, on July 13th, 1932. One weighed 9 st. 13 lb., the other 2 lb. less. A Short Sunfish was taken in Filey Bay first week in August, 1932. It was a small example measuring just over 2 ft. from tip to tip of its fins. A very beautiful pied variety of the Common Sole was landed at Scarborough on October 11th, having being caught near that place. It measured 11 in. in length, the general colour above and below was pinkish-white, variegated with orange and dark-brown blotches, both sides being coloured alike. Pilchards are not common off the Yorkshire coast, but are doubtless much overlooked. Six examples were noticed amongst the catches of herrings landed at Scarborough between July 21st and July 26th, 1932. A Twaite Shad, 13 in. long, was trawled 37 miles E.S.E. off Scarborough on April 25th, 1932. A small Sturgeon about 5½ ft. long was landed at Scarborough on May 19th, having being caught near the port. Another about 2 ft. long was caught 26 miles E. by N., on March 4th, and a third was taken 12 miles E. by S. off Scarborough on January 7th, 1932. It weighed 7 lb.

Porbeagle Sharks were very abundant off Scarborough and Whitby during the warm months, and many were caught by the fishing boats, while they proved a nuisance to the Tunny anglers. They ran up to 9½ ft. in length.

A Sting Ray, 16 in. long, was trawled 12 miles N.E. off Scarborough on February 9th, 1932. This poisonous species has occurred more frequently off the Yorkshire coast in recent years.

A Sea Lamprey, 31¼ in. in length, clung to the side of a boat near Robin Hood's Bay on January 21st, 1932, and was gaffed. Every Tunny I have been able to examine has borne scars from the attacks of this parasite fish.

An Angel Shark, Fiddle Fish, or Monkfish (not the " Monk ' of the Yorkshire fishermen), measuring 36 in. in length, was caught 12 miles N.E. off Scarborough on September 13th, 1932. This is not a common fish off the Yorkshire coast, and most of the fishermen had never seen one.

Birds.—Owing to the inclement weather in the spring of 1932, the summer migrants were generally late in their arrival, and some did not appear in their usual numbers. Chiff Chaffs, Sand Martins, Turtle Doves, and Landrails were very scarce in the Scarborough Area. At Whitby, however, Landrails were heard in eleven different places during June, and a Turtle Dove was seen near the same place where it seldom occurs. There was no evidence of the presence of Reed Warblers at Scarborough Mere this year, and only a single Grasshopper Warbler was heard. Swifts were more numerous, as well as Common Sandpipers, whose numbers showed a welcome increase on recent years on all the streams in the Scarborough Area. Goldfinches were more abundant near Scarborough and nested there. Pied Flycatchers appeared in some numbers. Five pairs nested near Goathland, and three pairs in Forge Valley, where seven male birds were seen together on May 14th 1932. Grey Wagtails were not so plentiful as usual during the past year, but all the usual nesting places for Dippers and Kingfishers were occupied, and both these species are well maintaining their numbers. Curlews were

plentiful on the Scarborough side of the Moors, but Golden Plovers were but few in numbers, and Ring Ouzels were scarce this year.

Yellow Hammers and Greenfinches were fewer in numbers, and not a single Bullfinch was observed during the year in the Scarborough Area. Waxwings appeared in some numbers near Scarborough from December 1931, to February, 1932, flocks of up to 30 individuals being seen, which stayed about for some days. Some of them penetrated far within the boundaries of Scarborough, feeding in the gardens on apples, berries, etc. A male Golden Oriole was seen near Hackness Park on July 30th, 1932. A Little Owl was noticed at Burniston on October 27th, and a Red-necked Grebe lived in Throxenby Mere for several days in April, 1932. Many Woodcocks nested in the woods near Scarborough ; they appear to be getting more abundant as a breeding species every year. Wild Fowl frequented the Mere during the winter months and those noted included Mallard, Pochard, Goldeneye, Scaup, Tufted Ducks, and one Long-tailed Duck. Two pairs of Teal nested on the Moors between Whitby and Scarborough, and the ducklings of one brood were found and photographed. The species also nested near Glaisdale. The colony of Black-headed Gulls on the Moor showed signs of being much molested. About 80 pairs of birds were present, but most nests had been robbed, only three were seen containing eggs, and not a single young bird was visible on May 30th. Fulmars were abundant along the cliffs, 30 were counted in the Scarborough Castle Cliff on February 11th. This number increased as the season went on to probably double this number and they stayed till September, but there was no definite evidence that young were reared.

The Recorder is greatly endebted to Messrs. A. S. Frank and F. Snowdon, of Egton and Whitby ; and to T. N. Roberts, and F. D. Taylor, of Scarborough for assistance in compiling this report.

**West Riding** (H. B. Booth, F.Z.S., M.B.O.U.) :—An adult male Common Scoter spent about a fortnight on Denton Lake, Ben Rhydding. I first saw it on April 2nd, and the last time on April 10th. It consorted chiefly with a single Mute Swan, and was not so wild and nervous as the other ducks (Mallard, etc.). It made repeated, and at times, lengthy dives for food, and appeared to have settled down, until the Swan left, when it became uneasy and suspicious, and disappeared. This water is very shallow, but contains large numbers of Swan Mussels (*Anadonta cygnea*), on the young of which it doubtless lived, and kept in good condition.

The Waxwing invasion during the last two months of 1931, was little in evidence in the West Riding, although they were eagerly watched for. It was a year of very poor fruiting, particularly for haws and holly berries, and possibly any Waxwings that lingered here starved to death. The only reports that reached me for this Riding were :—three were watched feeding on the fruits of hawthorn and guelder rose on November 22nd at Chapeltown, Sheffield, by Mr. W. E. Heathcote (*The Yorkshire Evening Post*, of November 27th, 1931), and the feathers of a female that had evidently been killed by a Hawk in the Deer Park, Bolton Woods, Wharfedale, were picked up on December 17th.

During the month of August a Cormorant frequented the River Wharfe in the neighbourhood of Bolton Abbey (Rev. C. F. Tomlinson). Snow Buntings, which have been very little in evidence for several years, turned up again. A flock were reported at Withens in November (W. R. Verity), two were seen on Ilkley Moor on November 22nd (H. Dibb), and one on the top of Royle's Head, near Halifax, on November 29th (H. Waterworth).

Herons.—We counted 21, what we took to be occupied nests in Lord Wood, Gargrave, as against 19 last year. At Hubberholme four nests were located by birds flying from them, and it is probable that there were one or two more ; as in their present site it is impossible to see

their nests in the great overgrown spruce trees. I was unable to visit Park House Ghyll, near Gisburn, but I gather that they have done badly there from Mr. Stanley Crook, in ' The North-Western Naturalist ' for June, 1932 (p. 125), who reports, ' Only about three or four pairs nesting at Bolton-by-Bowland, April 17th. Two adult birds found dead at foot of nesting trees (shot?). Many Carrion Crows about. (*N.B.*—This heronry is now mid-way between Gisburn and Bolton-by Bowland—formerly it was in Gisburn Park.) One or more pairs were nesting in Grass Woods, but owing to the height and density of the larches, it was extremely difficult to locate them (R. Butterfield). The pair in Westy Bank Wood, Bolton Abbey, again attempted to nest (at the other end of the wood), and with rather more success ; but it is not quite certain if the young succeeded in getting away (Rev. C. F. Tomlinson).

Rooks.—Although still a very common bird, there is good evidence to prove that it is a decreasing species in Mid-Wharfedale, and possibly in Mid-Airedale also. The substantial rookery in the grounds of Ilkley Hall, which had decreased to 59 nests in 1929, had further decreased to eight nests in 1931. This year it became extinct. A few pairs of the birds returned, and commenced repairing old nests : but left in their isolation. In Ben Rhydding village, where we had eight scattered nests last year, against 19 in 1930, we had not a single nest in 1932. Near the Ilkley Viaduct there was a slight increase, viz. 18 nests against eight last year, and 13 or 14 in 1930. Mr. G. Veale, who has for several years counted the Rook's nests between Ilkley and Threshfield and Grassington, reports that with one or two exceptions, there is a continued decrease in numbers. The chief exception is in the village of Addingham, where they have increased. At the Steeton rookeries, Mr. Sam Clough informs me that there were 251 nests, a decrease of 24 on the year ; but Mr. Clough has not shot any young Rooks for the last two seasons. Before that they were regularly shot annually.

Great-Crested Grebes.—A pair have returned, and successfully nested on the water at Coniston Cold, after an absence for three seasons. There is good evidence that a pair have nested on Eshton Tarn, for the first time to the best of my knowledge. I spent a short time at Fairburn this season, but on a casual observation, the Great Crested Grebes, although still comparatively numerous, appeared to be still decreasing in numbers.

Other Nesting Notes.—Near to Ben Rhydding a pair of Spotted Flycatchers hung about from the beginning to the 17th of September, at first with four, but later with three young ones ; evidently a second brood, which is rare with this species. Near to the same spot, and most probably belonging to the same pair of birds, on June 4th, there was a nest containing four eggs. More nests of Kingfishers have successfully got away near Ben Rhydding this season than for several years, and I am given to understand it has been the same around Cottingley in Airedale. For a few years the Green Woodpecker has frequented the district around Buckden and Hubberholme. This year it appears to have increased there, and was very noisy. This year this species has successfully nested near Hebden Bridge. A young one (badly damaged) was picked up in Crimsworth Dean on June 27th, and another one has since been found (W. R. Verity). The last of our local Swifts left very early on August 13th, and in the midst of a heat wave, when winged food appeared to be superabundant. The following day (14th) a young Swift fell out of a nest. It was fully feathered, but was only about three-quarters adult size, and was unable to fly. It was kept until the next day, when, as its parents did not return, and there was no possible chance of keeping it alive, it was put out of its misery.

No Shovelers were seen at Coniston Cold this year, but a pair were noted at Fairburn on April 30th. The Black-headed Gulls did not appear to be nesting at Fly Flats reservoir this summer, probably due to the

disturbance caused by the repairing and cleaning out of the dam (H. Waterworth).

The head forester at Bolton Woods flushed a Woodcock on July 26th, and not suspecting a nest so late, found that he had put his foot on to two eggs, about one week incubated. This was near to Strid Cottage, where there was a very late nest several years ago.

On April 24th one nest of Golden Plover contained three fresh eggs, and another four eggs slightly incubated (G. Veale). Yet on June 19th, another Golden Plover was still incubating, and the eggs were almost ready to hatch (A. E. Pullan).

Stray Notes.—There were many more Siskins about in January last than during the 24 years I have lived here—in fact in most winters we do not see one at all. On January 24th I watched a flock of quite twenty Long-tailed Tits, which is a very large flock for these parts. I was hoping that there was a welcome increase in Jack Snipe last winter unless it was the same bird that I put up many times over two or three months, as I never saw more than one at the same time. In game birds, Partridges have done badly, Red Grouse poorly, but slightly better than was expected, and Pheasants appear to have done well. Black Game, which have inhabited extreme Upper Wharfedale for a great number of years, appear to be slowly increasing.

A bird picked up in dying condition at Appletreewick, during the last week in September, is being set up for the Craven Museum. I have not seen it yet, but it is described as a Pomatorhine Skua. If its description in the newspapers is anything to go by, I shall be surprised if it is any kind of a Skua at all.

Variation. A White Twite was seen on Haworth Moor, in August (R. Butterfield). On July 7th, among a flock of about twenty Mallard, on Denton Lake, Ben Rhydding, was one that appeared to be pure white and a female. On my trying to get a better view, the flock rose high into the air, and apparently left this neighbourhood.

## MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

Mammals (W. G. Bramley) :—From reports reaching me from observers in different parts of the county, Red Squirrels are with difficulty maintaining their status. A welcome increase is indicated from the Whitby area, though this is somewhat tempered by the presence of disease, as several dead Squirrels have been observed.

In spite of persecution the Grey Squirrel is not only maintaining its numbers, but is also gradually extending its range, especially in the North Riding. The colony at Hebden Bridge is an exception, and is only just maintaining its numbers. None have been seen in the Goathland district since first reported in 1930.

Mr. A. D. Middleton, of Oxford, informs me that during 1931 that epidemic disease caused a considerable reduction in the numbers of the ' American Rat.' He writes : ' I got a good deal of evidence, though not quite conclusive, that the disease was coccidiosis in the South of England, and I got the same organism from Grey Squirrels from Thornton Dale during 1931. But as the coccidia can reach a sort of harmless balance with their host, and only occasionally crop out as a lethal epidemic, the mere presence of coccidia in the animals does not prove that they died of coccidiosis. All the evidence I have fits the conclusion that the Grey Squirrel throughout the country did have an epidemic of this disease during the autumn, winter and spring, 1930-31, and I, personally, have little doubt about it, but I cannot prove it scientifically.'

The heavy rains and floods about the end of May are probably partially responsible for the scarcity of the Rabbit, many of which were drowned,

and in the North Riding suffered from disease. Hares are also diminished in numbers.

The smaller mammals, Mice and Voles, are in very small numbers following a year of floods in 1931, which was also a minimum year for these destructive pests. A Lesser Shrew was caught by Mr. S. H. Smith at Scoreby, near York, on October 1st, and the convenor noted the Water Shrew at Nun Appleton on April 24th.

An increase is indicated in Stoats and Weasels. Hedgehogs also appear to be more numerous, especially in the East Riding. In several parts of the York area Moles are becoming a nuisance. Mr. Smith suggests this may be due to the disappearance of the old-fashioned Mole Trapper the destruction of the animals now being left to the individual occupier of the land.

In the Halifax district Foxes are becoming too numerous for the liking of poultry keepers, and several have already been destroyed. They make their headquarters in old disused stone quarries.

Badgers still continue to maintain their hold in their usual habitats in the county, while Otters are gradually increasing, especially in the York district. Two were seen nearly every evening disporting in the Ouse near Scarborough Bridge, York, practically in the centre of the city. Another swimming near Linton-on-Ouse, July 20th, in broad daylight dived completely under a passing vessel and then swam carelessly away.

The colony of Black Rats round the harbour at Scarborough is decreasing in strength. Between January 1st and October 11th, 1932, only 15 were caught as against 46 in 1931 and 60 during 1930.

A school of Porpoises has been seen in the Humber. Of late years this used to be a common sight, but has not been observed of recent years.

**Reptiles.**—A Grass Snake was caught at Long Wall, Elland, early in September. In the Holderness area they are becoming plentiful.

**Amphibians.**—After the scarcity caused by the drought in 1929 Frog spawn is now rapidly regaining its normal amount.

I am indebted to Messrs. S. H. Smith, W. J. Clarke, H. B. Booth, C. F. Proctor, W. Greaves, and R. J. Flintoff for information used in compiling this report.

**Hornsea Mere, 1932** (Chas. F. Procter) :—We started watching on May 16th at the above, and finished on July 23rd. The Herons at that time were well away. There had been twenty nests, all of which had successfully reared young.

On May 16th there were seven Swans. Three pairs of these nested and reared five, six and two cygnets respectively. Their numbers are swollen at the present time, and the last count gave us 63 all in.

The Ducks have done well this year. It is probably a record year. There is a good show of Mallard, Shovellers, Pochard, Tufted, and Teal ; one or two Shelldrakes have visited the Mere from time to time.

There have been many Snipe, which have bred in the open spaces round the Mere. Ten pairs of Great Crested Grebes appear to have bred, but for some reason or other the young are very shy this year. A family party of four and another of three have been seen, and the others seem to have one each or two each. They appear to average about a pair. There is a fair sprinkling of Little Grebes.

There are again a great many Coots, but they do not appear to have interfered with the Ducks at all. There are not many Water Hens, considering the amenities that the Mere affords, but it is more than probable that the Coots see that they do not get too numerous.

The west end of the Mere has been a perfect bird sanctuary ; on the occasions on which I have visited it, there have been thousands of all sorts of wild fowl in close proximity to one another.

Cormorants have been steady residents throughout the year. Two Kingfishers built their nests and got off with four and three respectively.

Two Woodcocks brought off four and three respectively. This latter is very interesting, as it is the first time the Woodcocks have been recorded as nesting here.

The Bearded Tit has not been seen. This does not, however, preclude its presence. Many Goldfinches have been about the whole of the summer, and as many as nine nests have been noted. Most of the small birds and finches have done very well. There are a good many Woodpeckers. Reed Warblers have been especially abundant.

A very interesting curiosity in nesting occurred when a Wren took possession of the feathered carcase of a Kestrel hung from the keeper's vermin pole, and reared a tight packet of a dozen or more young. The body was nailed through the skull and all the flesh had fallen away from the neck vertebrae. The bird had entered through the pelvic arch, and I constantly expected that the increasing weight as the young birds grew would be more than the contact adhesion of the neck vertebrae would stand. I am pleased to say, however, that they managed successfully to get off.

**Spurn**—Ringed Plover.—At Kilnsea we started watching on May 16th. By July 18th we had marked twelve nests containing four eggs uniformly each, on the Beacon and eleven on the Spurn similarly containing four eggs. One found on May 15th was afterwards found to have only three, but with that exception, all the others seemed to be undisturbed.

The Terns were very much more erratic. They started laying about May 29th, and up to June 26th 48 nests had been recorded with two or three eggs, a total of 125 ; no nests with less than two were recorded after June 26th, and only four with two up to that date. Two of these again laid another egg each, so that June 26th may be taken as about the last recorded period when eggs were laid.

The notices which the Union fixed a few years ago appear to have at least had the effect of making common knowledge that it is illegal to touch the eggs, and there has been little trouble this year.

An Oystercatcher laid three eggs and was first observed on June 26th at Kilnsea on the Humber side. They were all hatched out on July 3rd. This is an interesting record. There have been no abnormal tidal conditions, and for the second year in succession the birds appear to have done well. The colony, however, does not seem to appreciably increase, as last year the number of nests recorded was 48.

The Stone Curlews do not appear to be doing very well in the Thornton Dale district. Mr. J. Green only reports two pairs nesting, and it was wet and stormy every day they were sitting. The birds nesting ground has been nearly all planted up under the reafforestation scheme. A pair were reported as frequenting the 50-acre rough pasture field, below the village, but no signs of a nest were found. They may not have been a nesting pair, or, alternatively, they may have been sterile.

Mr. Green reports a tremendous lot of Lesser Whitethroats in the Thornton Dale district. He reports a Gold Crested Wren as having nested behind the ivy on an old tree bole, like a tree creeper. Mr. Green also reports Goldfinch and Bullfinch within a short distance of the Gold Crest. He reports having seen twelve Geese passing westward on July 12th. They were probably Canada Geese, as from time to time during the summer months parties of these leave private waters and wander around.

With respect to the season generally, it appears to have been a good one for most birds. Wood Pigeons have been plentiful, game birds have been patchy, but all the finches and commoner birds have had an excellent nesting time. A great many Kestrels have come over this year, and Ducks have been very plentiful in the estuary, but up to the present no Woodcock have been noted. The Pink-footed Geese arrived in their usual numbers.

There has, however, been nothing of outstanding note to record.

*1933 Jan. 1*

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## ENTOMOLOGICAL SECTION

**Diptera** (Chris. A. Cheetham) :—Good collecting days have been very few this year, and no special insects have been seen in quantity unless we say that some of the biting midges belonging to Ceratopogonidæ have been too plentiful at times. In an effort to find a ♀ of *Tipula excisa* many visits were paid to Penyghent and Ingleborough, but these were unsuccessful, in fact the ♂♂ were exceedingly scarce and few were captured, the one occasion that a species of *Tipula* was seen in numbers sufficient to cause comment was at Leck Fell on August 20th where *Tipula marmorata* was very abundant, *T. alpium* was plentiful as usual, but *T. vernalis* much scarcer than it is normally.

**Ephemeroptera** (John R. Dibb) :—In presenting this first report it is pleasing to realise that another step forward has been made in the progress of the Y.N.U. in so far as the Ephemeroptera is an order of insects which has not been considered until a year ago to be sufficiently worked upon in Yorkshire to warrant the presentation of an annual report.

This is a suitable occasion upon which an acknowledgement to previous Y.N.U. workers may be made. I refer to the excellent and valuable work which was done during the years 1927-1929 by Dr. Percival and Mr. H. Whitehead. Fortunately the results of this work were published in *The Journal of Ecology, The Entomologists' Monthly Magazine, The Proccedings of the Leeds Philosophical Society,* and the Union's organ, *The Naturalist,* and undoubtedly we have to thank these investigators for the fact that other Y.N.U. members are now interesting themselves in the May-flies, and that our knowledge of the Yorkshire Ephemeroptera is definitely on the advance.

(*To be Continued*)

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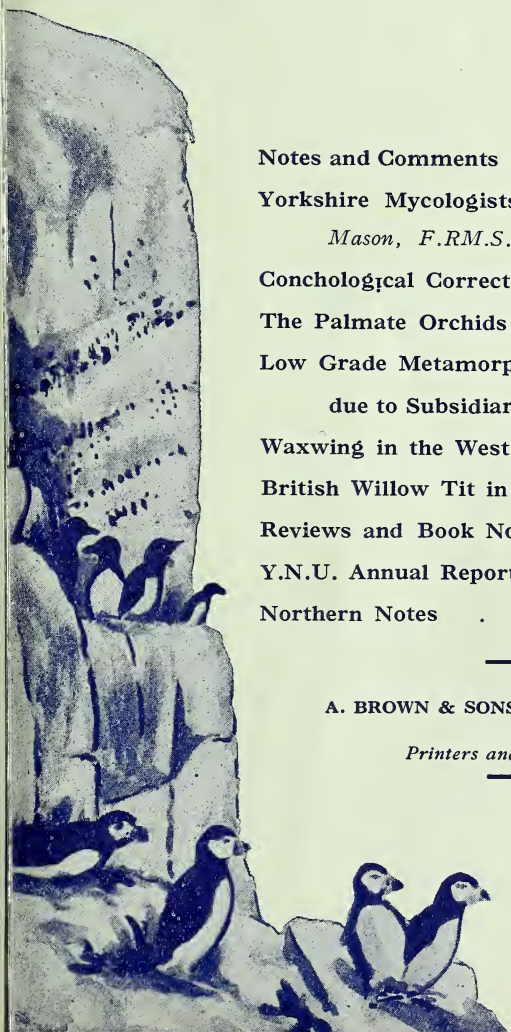

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# YORKSHIRE NATURALISTS' UNION.

## VERTEBRATE SECTION.

*President of the Section* : Rosse Butterfield, Keighley.

Two meetings will be held in the Library of the Church Institute, Albion Street, Leeds, on Saturday, February 18th, 1933, at 3-15 p.m. and 6-30 p.m.

The following papers will be read :

'Human Influence on changing Vertebrate Fauna,' by Rosse Butterfield.

'The Great Crested Grebe Census and Enquiry of 1931 : The Yorkshire Area,' by H. B. Booth, F.Z.S., M.B.O.U.

'Recent Birdwork in Lapland and in the English and Dutch Marshes' (illustrated), by R. Chislett, F.R.P.S., M.B.O.U.

'A Duncombe Park Avian Quartet' (illustrated), by F. Jefferson.

Members are invited to bring notes, specimens, and lantern slides. Will officials of affiliated societies kindly notify their members.

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# NOTES AND COMMENTS.

## FAKES AND FORGERIES.

A. Vayson de Pradenne has recently issued a handsome volume entitled *Les fraudes en archeologie prehistorique avec quelques exemples de comparaison en archeologie generale et sciences naturelles*.[1] V. Gordon Childe in referring to this in *The Antiquaries Journal* for October says, 'The English may, perhaps, derive some small comfort from the circumstance that the most glaring and persistent frauds were perpetrated in countries where criticism is traditionally frank and brutal. The only extensive fraud in this country which has had any lasting repercussions is that of Dumbuck and Dunbuie, which Munro exposed with ruthless directness. The normal English practice of greeting well-sponsored forgeries with (at worst) polite silence may, perhaps, after all, be the safest road to ensure their eventual burial. But it is not the attitude recommended by Vayson; to him every one who, out of laziness, courtesy, or like motives, fails to fall upon the fraud ferociously is a coward and a traitor. At the same time, the reader will be struck by the part played by Englishmen—John Evans, Seton-Karr, etc., in unmasking forgeries abroad.'

## RETICULATA OR RIDICULATA?

In *The Quarterly Journal of the Geological Society of London*, issued in November, Dr. T. N. George has a paper on 'British Reticulate Spiriferidæ.' From this we gather: 'At first sight it would appear that, according to Rule 30 (d) of the Rules of Nomenclature, *Reticularia reticulata*, of which the specific name has the same meaning as the generic, automatically becomes the type: the late Mr. Buckman informed me (*in lit.*) that such was his reason for adopting this species without discussion (1908, p. 31) and further added, "No subsequent author has any right to choose another species; if he does so, it is invalid." On the other hand, as Dr. Bather has pointed out to me, since "*reticulata*" is not literally the same word, though it may have the same meaning, as "*Reticularia*," it would appear that the question strictly falls under Recommendation III (i) of the Rules, which suggests the adoption of a different but similarly-meaning specific name only when there is no contra-indicating factor. In the present instance, the factor which prevents preference being shown to *Reticularia reticulata* is the fact that a genolectotype has already been selected from amongst M'Coy's original syntypes, "and such designation is not subject to change."'

[1] Paris: Nourry, pp. viii+676, with 46 plates.

### MR. W. H. ST. QUINTIN'S BIRDS.[1]

The publishers have put us under a further debt of gratitude by issuing this delightful and well-illustrated volume. Interest is being continued in wild fowl and in our public parks and private aviaries can still be seen such species as can readily be kept in captivity in this country. The present work is all the more welcome as it describes the species preserved in the wonderful aviaries and gardens of a former President of the Yorkshire Naturalists' Union, and one who has done so much for the preservation of bird life, both in captivity and in the wilds, namely, Mr. W. H. St. Quintin. The author was formerly in Mr. St. Quintin's employment, and the species described are those which he personally observed at Scampston Hall. As many of our members who have had the privilege of visiting Scampston know, the birds there are kept under as natural conditions as is possible. The species are described under the heads of Herons, Storks, Geese, Swans, Small Water Fowl, Tree Ducks, Diving Ducks ; Sand Grouse, Pheasants, Tragopans, Partridges Quails, Hemipodes or Bustard Quails, Grouse, Rails, Cranes, Bustards, Small Waders, Gulls, Aviaries, Foods and Feeding, Pear-Moss Litter, Overcrowding, New Arrivals. Catching up and handling, Packing birds for travel, Feather clipping and pinioning, Vermin, Diseases, Accidents. The variety of the different species under these headings is remarkable. For instance, there are no fewer than twenty different species of pheasants, seven different Sand Grouse, and so on. There are some excellent illustrations, and we notice the photographs are by Peter Scott, the son of Scott the Explorer ; Sir Digby Legard, Bt. ; and Oxley Grabham.

### DR. HARKER'S LATEST WORK.[2]

When, forty years ago, our colleague Dr. A. Harker discontinued preparing the Annual Bibliographies of the Geology of the North of England for this journal, and handed the work over to the present writer, he did not remain idle, and from time to time we have had the privilege of drawing attention to extraordinarily scholarly volumes which have appeared from his pen, some of which have already an international reputation. The present book contains a series of lectures delivered at Cambridge and is certainly the 'last word' on the subject. The author tells us that 'Metamorphism is here conceived, not as a status, but as a process ; viz. : a progressive change in response to changing conditions of temperature and stress.'

[1] *Water-Fowl and Game-Birds in Captivity*, by Arthur F. Moody. London : H. F. & G. Witherby, 240 pp., 10/6 net.

[2] *Metamorphism : A Study of the Transformation of Rock Masses*, by Alfred Harker. London : Methuen & Co., x+360 pp., 17/6 net.

## YORKSHIRE MYCOLOGISTS AT KIRBYMOORSIDE.

F. A. MASON, F.R.M.S., AND JOHN GRAINGER, PH.D.

THE Annual Meeting of the Mycological Committee of the Yorkshire Naturalists' Union was held at Kirbymoorside from September 17th—22nd, 1932. The White Horse Hotel arranged to accommodate the members of the Committee, and a large work-room was available.

Kirbymoorside is a small town situated between the North York Moors and the upper part of the Vale of Pickering. Two ecological types of collecting ground were therefore presented—the valleys and hills with limestone vegetation and the cultivated alluvial plain to the south of the centre. The latter type of country is often difficult of access to a large party, but the visitors to Kirbymoorside were fortunate in having the very active assistance of Mr. J. Burnett and Mr. Lealman, who knew the district, and brought in collections of fungi from various places. Nevertheless, the species in the list which follows can all be regarded as typical of the valleys, the sides of which were invariably lined with woods of a very mixed character. If any one tree could be said to be present more generally than any other, it was the oak. Sycamore, birch and holly were plentiful. The undergrowth was mainly *Mercurialis* and except in Kirkdale was fairly dense.

The chief excursions were to the woods round the River Dove, to Hutton Beck and to Kirkdale. All these localities were rich in specimens and afforded much work for the members present.

The Annual Meeting of the Committee was held at the White Horse Hotel on Saturday, September 17th, at 8 p.m., under the able chairmanship of Mr. J. W. H. Johnson, M.Sc. Mr. A. E. Peck was elected chairman of the Committee for the coming year, and Mr. Fowler Jones was named Representative of the Committee on the Executive. Mr. J. Grainger was re-elected Hon. Secretary.

Mr. T. Petch, B.A., B.Sc., addressed the Committee the same evening on ' The Hypocreaceæ.' He dealt in a very simple yet scholarly manner with the characteristics and classification of this difficult group of Fungi.

The Secretary spoke about ' Virus Diseases of Plants ' on the evening of Monday, September 19th, and the following evening Mr. F. A. Mason, F.R.M.S., delivered a public lecture on ' Fungi ' which was much appreciated, not only by members of the Union, but also by the more enlightened public of Kirbymoorside and the neighbourhood.

The name of Miss Kathleen Morehouse was added to the list of members of the Committee.

The different species of fungi found proved to be unusually

uniformly distributed in this area, despite slight differences in the character of the several places visited. The woods in the neighbourhood of Hutton Beck yielded the more prolific gatherings, and what species were found there were duplicated in the Kirkdale area. The addition to the County records of three species may be considered very satisfactory. *Lactarius violascens* found in woods on the right hand bank of the River Dove is a very interesting addition to our Lactarii. The investigation also resulted in obtaining records for twelve other species new to the well-worked N.E. Division, V.C.62, threee of which are first records in the County.

*=New to N.E. Division ; †=New to Yorkshire.

### Myxomycetes.

*Ceratiomyxa fruticulosa* Macbr.
*Physarum nutans* Pers.
*P. nutans.*
var. *leucophæum* List.
*P. virescens* Ditm.
*Fuligo septica* Gmel.
*Didymium nigripes* Fr.
*Stemonites fusca* Roth.
*S. splendens* Rost.
*Comatricha nigra* Schroet.
*Comatricha. typhoides* Rost.
*Cribraria argillacea* Pers.
*Tubifera ferruginosa* Gmel.
*Reticularia Lycoperdon* Bull.
*Trichia decipiens* Macbr.
*T. varia* Pers.
*Arcyria cinerea* Pers.
*A. pomiformis* Rost.
*A. denudata* Wetts.
*A. incarnata* Pers.

### Phycomycetes.

*Synchytrium Mercurialis* (Lib.) Fuckel.
*Phytophthora infestans* (Mont.) de B.
*Cystopus candidus* (Pers.) de B.
*Plasmopora Epilobii* Schroet.
*Peronospora Ficariæ* Tul.
*Mucor Mucedo* (Linn.) Bref.
*Spinellus fusiger* (Link) van Tiegh.
*Pilobolus roridus* (Bolt.) Pers.
*Entomophthora aphidis* Hoffm., on aphis on Sycamore.
*E. sphærosperma* Fres., on flies.
*E. dipterigena* Thaxt., on flies.

### Plectomycetes.

*Podosphæra leucotricha* (Ell. and Ev.) Salmon, conidial stage only.
*Sphærotheca pannosa* (Wallr.) Lev., conidial stage only.
*Erysiphe graminis* DC., conidial stage only.

### Discomycetes.

*Helvella crispa* (Scop.) Fr.
*Otidea leporina* (Batsch) Fuckel.
*Ciliaria scutellata* (Linn.) Quel.
*Cheilymenia stercoria* (Cke.) Boud.
*Coprobia granulata* (Bull.) Boud.
*Ascophanus carneus* (Pers.) Boud.
*Leotia lubrica* (Scop.) Fr.
*Calycella citrina* (Hewg.) Quel.
*Coryne sarcoides* (Jacq.) Tul.
*Orbilia xanthostigma* Fr.
*Phialea firma* (Bull.) Quel.
*Chlorosplenium aeruginosum* (Oeder) de Not.
*Helotium aureum* Pers.
*Dasyscypha nivea* (Hedw. fil) Sacc.
*Trichoscypha calycina* (Schum.) Boud.
*Mollisia atro-cinerea* (Cke.) Phill.
*M. cinerea* (Batsch) Fr.
*Rhytisma acerinum* (Pers.) Fr.

PYRENOMYCETES.

*Hypomyces chrysospermus* Tul.
*Nectria cinnabarina* (Tode) Fr.
*N. ditissima* Tul.
**N. galligena* Bresad.
*Hypocrea rufa* (Pers.) Fr.
*Cordyceps militaris* (Linn.) Link.
*Chætosphæria phæostroma* (Mont.) Fuckel.
*Melanomma pulvis-pyrius* (Pers.) Fuckel.
*Leptosphæria acuta* (Moug. and Nestl.) Karst.
*Xylaria polymorpha* (Pers.) Grev.
*X. hypoxylon* (Linn.) Fr.

HEMIBASIDIOMYCETES.

*Ustilago Hordei* (Pers.) Kell. and Swing.
*Urocystis Anemones* (Pers.) Wint.
*Pucciniastrum Circaeæ* (Schum.) Speg.
*Coleosporium petasitis* Lev.
*Puccinia Centaureæ* DC.
*P. Violæ* (Schum.) DC.
*P. Poarum* Niels.
*P. Lychnidiarum* Link.

BASIDIOMYCETES.

*Amanita phalloides.*
*A. muscaria.*
*A. rubescens.*
*Amanitopsis vaginata.*
*A. fulva.*
*Lepiota procera.*
*L. carcharias.*
*L. rhacodes.*
*L. granulosa.*
*Armillaria mellea.*
*Tricholoma album.*
*T. rutilans.*
*T. terreum.*
*Russula nigricans.*
*R. cyanoxantha.*
*R. furcata.*
*R. lepida.*
*R. heterophylla.*
*R. rubra.*
*R. fragilis.*
*R. emetica.*
*R. ochroleuca.*
*R. fellea.*
*R. adusta.*
*Mycena lactea.*
*M. prolifera.*
*M. rugosa.*
*M. polygramma.*
*M. alcalina.*
*M. ammoniaca.*
*M. hematopus.*
*M. sanguinolenta.*
*M. galopus.*
*M. acicula.*
*M. rosella.*
*M. tenerrima.*
*Collybia platyphylla.*
*C. fusipes.*
*C. maculata.*
*C. radicata.*
*Marasmius peronatus.*
*M. hariolorum.*
*M. dryophilus.*
*M. ramealis.*
*Androsaceus rotula.*
*A. graminum.*
*Lactarius turpis.*
*L. pyrogalus.*
*L. deliciosus.*
*L. quietus.*
*L. aurantiacus.*
*L. rufus.*
*L. torminosus.*
*†L. violascens* (Otto) Fr.
*Hygrophorus eburneus.*
*H. cossus.*
*H. pratensis.*
*H. niveus.*
*H. miniatus.*
*H. conicus.*
*H. ceraceus.*
*H. nemorius.*
*H. puniceus.*
*H. psittacinus.*
*Clitocybe phyllophila.*
*C. dealbata.*
*C. infundibuliformis.*
*Laccaria laccata*
var. *amethystina.*
*Omphalia fibula.*

BASIDIOMYCETES (*Continued*).

*Panus stypticus*
var. *farinaceus.*
**Volvaria parvula.*
*Pluteus cervinus.*
*P. salicinus.*
*Entoloma sericeum.*
*E. nidorosum.*
*Leptonia lampropus.*
**L. lazulina.*
*L. sericella.*
*L. euchroa.*
*Clitopilus prunulus.*
*Pholiota erebia.*
*P. squarrosa.*
*P. flammans.*
*P. mutabilis.*
*Bolbitius flavidus.*
*B. titubans.*
*Inocybe scabra.*
*I. geophylla*
var. *lilacina.*
*I. calamistrata.*
**Astrosporina trechispora.*
*A. scabella.*
*Hebeloma fastibile.*
*H. mesophæum.*
*Naucoria Cucumis.*
*Galera tenera.*
*G. ovalis.*
*G. hypnorum.*
*G. mniophila.*
*G. mycenopsis.*
*Tubaria furfuracea.*
*Cortinarius* (Phleg.) *largus.*
*C.* (Phleg.) *decolorans.*
*C.* (Myx.) *elatior.*
*C.* (Myx.) *delibutus.*
*C.* (Ino.) *violaceus.*
*C.* (Ino.) *pholideus.*
*C.* (Dermo.) *cinnamomeus.*
*C.* (Tela.) *bulbosus.*
*Psalliota xanthoderma.*
*P. campestris.*
*P. hæmorrhoidaria.*
*Stropharia æruginosa.*
*S. stercoraria.*
*S. semiglobata.*
*Anellaria separata.*
*A. fimiputris.*
*Gomphidius glutinosus.*
*G. viscidus.*
*Hypholoma velutinum.*
*H. fasciculare.*
*H. hydrophilum.*
*Panæolus campanulatus.*
*P. papilionaceus.*
*Psathyrella atomata.*
*P. disseminata.*
*Psathyra corrugis.*
*Psilocybe sarcocephala.*
*P. semilanceata.*
*P. spadicea.*
*Coprinus comatus.*
*C. sterquilinus.*
*C. atramentarius* var. *soboliferus.*
*C. cinereus.*
*C. micaceus.*
*Nyctalis asterophora.*
*Cantharellus cibarius.*
*C. tubæformis.*
**C. cinereus.*
*Paxillus involutus.*
*Boletus elegans.*
*B. badius.*
*B. chrysenteron.*
*B. subtomentosus.*
*B. edulis.*
*B. scaber.*
*Tylopilus felleus.*
*Polyporus varius.*
*P. squamosus.*
*P. sulphureus.*
*P. adustus.*
*P. lacteus.*
*Fomes igniarius.*
*F. pomaceus.*
*F. annosus.*
*F. ferruginosus.*
*Polystictus hirsutus.*
*P. versicolor.*
*Irpex obliquus.*
*Daedalea biennis.*
*D. quercina.*
*Coniophora puteana.*
*Phlebia merismoides.*
*Fistulina hepatica.*
*Hydnum repandum*
var. *rufescens.*
*Grandinia farinacea.*
*Phylacteria terrestris.*
*Hypochnus umbrinus.*
*Stereum spadiceum.*
*S. rugosum.*
*S. hirsutum.*
*S. purpureum.*
*Corticium laevæ.*
*Clavaria cristata.*
*C. cinerea.*
*C. Kunzei.*
*C. inæqualis.*
*C. vermicularis.*
*C. persimilis.*
*C. rugosa.*
†*C. crassa* Britzl.
*Pistillaria furcata.*
*P. uncialis.*

*Tremella frondosa.*
*T. lutescens.*
*Exidia glandulosa.*
*Dacryomyces deliquescens.*
*Calocera viscosa.*
*C. cornea.*
*Cynophallus caninus.*
*Phallus impudicus.*
*Lycoperdon perlatum.*
*L. pyriforme.*
*L. echinatum.*
*Bovista nigrescens.*
*Crucibulum vulgare.*

Fungi Imperfecti.

*Phyllosticta Violæ* Desm.
*Phoma herbarum* West.
*B. samararum* Desm.
*Cytospora ambiens* Sacc.
**Fusicoccum Pini* (Preuss) Sacc.
*Coniothyrium Fuckelii* Sacc.
*Hendersonia Henriquesiana* Sacc. and Roum., on Rosa fruits.
*Monilla fructigena* Pers., on apples.
*Oidium alphitoides* Griff. and Maubl., on oak.
*O. farinosum* Cke., on hawthorn.
**Cephalosporium muscarium* Petch, on *Trichia decipiens.*
**Acremonium album* Preuss, on flies.
*Botrytis cinerea* Pers.
*Acrostalagmus cinnabarinus* Corda.
*Trichothecium roseum* Link.
*Ramularia lychnicola* Cke.
*R. Primulæ* v. *Thuem.*
†*Cladosporium aphidis* v. *Thuem.*, on flies and aphis.
*Helminthosporium velutinum* Link, on decorticated wood.
**Macrosporium commune* Rabenh.
*Isaria farinosa* (Holms.) Fr., on pupæ.
†*Hymenostilbe arachnophila* (Ditm.) Petch, on spider.
*Tuberculariа vulgarias* Tode.
*Fusarium culmorum* (W. G. Sm.) Sacc., on wheat.

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## CONCHOLOGICAL CORRECTIONS.

Owing to unforeseen difficulties, a number of errors were included in the lists of mollusca given in the November (1932) number of *The Naturalist*, Excursion Reports. Mr. J. Davy Dean has kindly compiled the following list of corrections.

Page 342 (Sedbergh).
Line 26. For molluses, read molluscs.
,, 33. For *Limax concriptus*, read *Arion circumscriptus.*
Page 348 (Skipton).
Line 4. For Wilmore, read Wilman.
,, 6. For *Hyalinia alliana*, read *Hyalinia alliaria.*
,, 10. For *Hygromia strolata*, read *Hygromia striolata.*
,, 11. For var. *subcarnate*, read *subcarinata.*
,, 12. For (*Helix*) *rupestris*, read *Pyramidula rupestris.*
,, 15. *Clausilia nigosa*, read *Clausilia rugosa.*
,, 16. For *Cochlicopa lulrica*, read *Cochlicopa lubrica.*
,, 17. For *Bulimus obscuruis*, read *Bulimus obscurus.*
,, 20. For *Hygnonsia stroleta*, read *Hygromia striolata.*
,, 21. For *Hygnonsia rotundata*, read *Pyramidula rotundata.*
,, 22. For (*Helix sericla*), read (*Helix sericea*).
,, 26. As on line 12.
,, 28. ,, ,, 6.
,, 34. ,, ,, 15.

# THE PALMATE ORCHIDS OF CRAVEN.

BY J. N. FRANKLAND.

THE Flora of West Yorkshire is very obscure as to the palmate orchids occurring in Craven and very little has been written about them since. As there is still a lot of work to accomplish on this critical group of plants—in other parts as well as in Craven—all we can do at present is to compare our Craven plants with those found elsewhere, and so gain some idea of why and how they occur.

All the distinct species of palmate orchids have been noted in Craven, besides most of the varieties and many hybrids. The following is a list of the palmate orchids seen.

*Orchis latifolia* L.
-*O. incarnata* L.
*c. pulcherior* Dr.
*x. maculata*
*x. prætermissa* Var. *pulchella*
-*O. prætermissa* Var. *pulchella* Dr.
-*O. purpurella* Steph.
-*O. maculata* L.
*b. leucantha* Dr.
*x. prætermissa* Var. *pulchella*
*x. purpurella*
-*O. Fuchsii* Dr.
Var. *ovata* Dr.
*x. incarnata*
*x. maculata*
*x. prætermissa* Var. *pulchella*
*x. purpurella*
-*O. O'Kellyi* Dr.

The question now arises. Are all these true species, or are some of them only hybrids or states?

*Orchis latifolia* is the rarest palmate orchis of Craven and although it may be known on more occasions I have only one authentic record of it. Many leading botanists consider this plant a true species, but my own observations suggest that it is merely a hybrid between *Orchis prætermissa*, and *O. Fuchsii* or *maculata*, or both. In other districts where I have seen it in plenty, it grows only among groups of the above-mentioned parent plants, and the variations tending to one or the other are so many that we have to search long sometimes, to get a hybrid to conform to the accepted description of it Our one recorded plant for Craven occurred near *O. Fuchsii* and *O. prætermissa* Var. *pulchella*, and it is probably due to the scarcity of the latter that *O. latifolia* is so rare.

*Orchis incarnata* is the commonest of Craven's hollow-stemmed bog orchids. Except where it hybridises, and this is of very local occurrence, it is very easy to distinguish by the flesh-coloured florets with characteristic reflexed lip, and straight erect keeled and hooded leaves which are never spotted. This plant grows up to 1,500 feet above sea level. Its variety, *pulchrior*, is equally common. The variety is to be distinguished by its deep rich purple flowers, and less reflexed and rather broader lip. Though both are common, it is only rarely that we find them growing together. The type plant seems to prefer limestone bogs, while the variety is almost invariably found in deep peat mosses. The variety,

in suitable years, attains much more luxuriant proportions than the type ; indeed, it is our biggest palmate orchis. Our northern *O. pulchrior* does not differ from its southern equivalent either in size or minor details. I have seen it growing in Dorset in immense colonies.

Type *Orchis prætermissa* I have never seen in Craven. Its variety occurs, but not abundantly in any one spot. This variety probably takes the place of the type in the hilly parts of the north. It is a more slender and rather paler in colour, and its leaves are usually unspotted. To illustrate how difficult the palmate orchids can be I mention the following. Plants from a certain colony of *Orchis prætermissa* Var. *pulchella* which has been observed for many years were sent to Kew. The specialists there thought at first the orchids were either exceptional forms of *O. purpurella*, or a hybrid between this and *O. prætermissa* Var. *pulchella*, as leaves on some of the plants were very faintly spotted towards the tip. On examining further material, it was identified as *O. prætermissa* Var. *pulchella*.

Our most interesting species is *Orchis purpurella*. Although this orchis grows in several places in fair abundance it was only noted in Craven for the first time in 1931 when a gathering was sent to Kew, who were very interested in it, Craven being a new locality for the species. Kew expressed the view that our plant was form B as found by the Stephensons at Ambleside. There is no doubt whatever that this is a good species, for it grows in colonies quite apart and each plant exactly alike. Hybrids are found occasionally with one of the spotted orchids as the other parent. The lip of this plant is broad, and of a very rich deep purple colour, and it differs from that of any other palmate orchid by the fact that it is almost entire. The leaves are more or less faintly spotted at the tip. *Orchis purpurella* and *O. prætermissa* Var. *pulchella* have a superficial resemblance to each other, but their separation presents no difficulty to the writer. I have not observed a plant which suggested a hybrid between the two.

*Orchis maculata* is common but almost invariably on a peaty soil. It is quite a distinct species, for in several places it grows along with *O. fuchsii* without any intermediates occurring. In other places where a few intermediates are seen they are certainly hybrids. The white form, Var. *leucantha* is sometimes seen, but it is much rarer than the questionable *O. O'Kellyi*. This white variety, too, is more slender than the type and also has unspotted leaves. If *O. O'Kellyi* is a species, then this white *maculata* deserves the same rank.

By far the commonest of our palmate orchids is *O. fuchsii*. It occurs almost anywhere on dry or wet ground on both acid and alkaline soils, varying in colour and stature according

to situation. In general aspect and lipshape it keeps strictly true to type, and only as a hybrid does it possess any of the features of *O. maculata*. A white form occurs, often in small colonies but always near or among the type plants. This white form is the plant which has been called *Orchis O'Kellyi*. Some botanists aver that *Orchis O'Kellyi* does not occur in Craven, but if there is a plant worthy of the name then we have it in plenty. If not, no district has it. True, it differs from *Orchis fuchsii* in many minor respects. It is a more slender plant as a rule with white flowers and unspotted leaves. The florets, too, are smaller. Some years ago I sent specimens of our plant to the late Dr. Druce, who replied : ' This is undoubtedly *Orchis O'Kellyi*.' The plants sent to Druce were not growing on a limestone soil ; indeed, we get it as much away from limestone as on it. Druce wrote of it : ' Calcareous areas of Burren, Co. Clare, Galway, Sutherland and Yorks., etc.' If so, why is our white form of *O. fuchsii* on a non-calcareous area still *Orchis O'Kellyi*? And if there is a difference, why did Druce name it *O. O'Kellyi*? The truth is that *Orchis O'Kellyi* is merely a white form of *Orchis fuchsii*, and although these white forms may differ slightly, no dividing line can be drawn between a distinct species and an albino.

In 1930, I found a peculiar spotted orchis with almost elliptical leaves and a very long narrow flower spike. This was sent to Dr. Druce who named it *Orchis fuchsii* Var. *ovata*. Although distinct as an individual plant, we think it more a form than a variety.

Lip markings vary so much in all species that we cannot take this to be a reliable aid to identification, but the shape and outline of the lip means a great deal. As pressed specimens lose their colour and the lip shape is distorted, they are often of very little use. It is as well to take in addition several florets and preserve them loose in small test tubes containing fomalin reduced 5 per cent. They can be examined at any time.

Summing up we see that five distinct species of palmate orchids occur in Craven, and these are properly classified as follows.

*Orchis incarnata* L.
  *c. pulcherior* Dr.
  *x. maculata*
  *x. prætermissa* Var. *pulchella* Dr.
*O-. maculata* L.
  *b. leucantha* Dr.
  *x. prætermissa* Var. *pulchella* Dr.
  *x. purpurella*
*O-. purpurella* Steph.
*O-. Fuchsii* Dr.
  Var. *O'Kellyi* Dr.
  *forma ovata* Dr.
  *x. incarnata*
  *x. maculata*
  *x. prtæermissa* Var. *pulchella* = *latifolia.*
  *x. purpurella*

We accept the above species because they occur in places in abundance quite apart from any other and all quite to

type. Wherever any variation is noticed hybridisation is the cause.

*Orchis latifolia* and *O. O'Kellyi* are not species because they never occur in isolated colonies, but only in the company of other species, and then sparingly. *Orchis latifolia* is a hybrid. *Orchis* O'*Kellyi* an albino, just as white forms or varieties of *incarnata, maculata,* etc. If *Orchis purpurella* is not a species as sceptics sometimes tell us, from whence does it obtain its spotted leaves? It cannot be from *Orchis fuchsii,* for the lip shape is entirely different. If from *maculata,* how does it come to be found in isolated and quite uniform colonies? When we require a specimen we prefer to visit a colony of orchids and pick one at random knowing that it will be what we want. How can a plant be defined as a distinct species when one has to wander about a considerable time among masses of variable palmate orchids, and eventually find one or two which are considered to be ' good *latifolias.*'

Is there some peculiar factor at work in connection with the hybridisation of orchids? In most spots in Craven we find many species growing together and fail to find a hybrid, while in others hybrids are more common than type specimens. On one such tract we have *Orchis maculata-fuchsii-purpurella-incarnata* and Var. *pulchrior* and *prætermissa* Var. *pulchella,* and to spend an hour there and see all the variations gradually merging one into the other would almost shatter the faith of the most ardent student of palmate orchids. Perhaps it is spots like this that make some botanist very sceptical as regards accepting such species as *Orchis purpurella* ; but it is the fact that all these plants can be found in other places quite distinct that makes us keep the faith. As before mentioned, this cannot be said for *Orchis latifolia* and *Orchis O'Kellyi.*

## LOW GRADE METAMORPHISM OF THE ELLAND FLAGS DUE TO SUBSIDIARY FAULTING.

JAMES WALTON.

Flixby is bounded by Rastrick and Elland on the north, and by Huddersfield and Longwood on the remaining sides, and the major portion of the parish is occupied by a park which has been converted into a golf course. The Elland Flags are well exposed in this area and are traversed by three small east-west faults which may be considered as parallel branches of the Rishworth-Staincliffe fracture. Owing to extensive quarrying, the effect of these faults is well shown, and in the quarry at the northern end of Cowcliffe village, the smallest of them is seen together with a series of subsidiary fractures. The largest of these subsidiary faults has a throw of only one foot and it is almost vertical.

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At this point the Elland Flags consist of a series of sandstones, flagstones, shales and mudstones, and the beds can be conveniently compared with regard to the effect of the minor fracture upon them. There are three sandstone beds; the top one is a soft, even-grained rock; the bottom one is a hard even-grained sandstone ; while the third is a coarse, tough, ferruginous rock. The upper and lower beds have been ground up considerably and reduced to either sand or gravel, but, in the latter case, the fragments have been cemented together by limonite, which has been brought down by waters percolating through the ferruginous rocks above, and the result is a breccia with a limonite cement. The tough sandstone still remains compact near the fault, although it has been oxidised and has lost its toughness.

Two beds of mudstone are exposed in the quarry ; one is a tough, laminated, micaceous rock, while the other is very similar except that it contains a high percentage of carbonaceous matter. In neither case have the rocks been shattered, but they show considerable carbonisation. The carbonaceous shales have merely been shattered.

Near to the fracture the mudstones and shales have been dragged down and are bent, although in the case of the shales this is masked by the shattering action. This is not noticeable in the sandstones, which either slipped down as solid blocks or crumpled up without bending. The resistance to compression of a number of these beds was determined with the following results :—

| | *Pounds per square inch.* |
|---|---|
| Tough Sandstone ... ... ... | 2,700 |
| Upper Sandstone ... ... ... | 720 |
| Bottom Sandstone ... ... ... | 2,540 |
| Carbonaceous Shale ... ... ... | 105 |
| Grey Shaly Mudstone ... ... ... | 1,585 |

Although the Tough Sandstone has not been fractured, the Bottom Sandstone has been considerably crushed and it appears that the pressure exerted on the beds by this fracture was in the neighbourhood of 2,600 pounds per square inch. This was quite sufficient, but did not crush the Grey Shaly Mudstone. This is explained by the fact that the mudstone was capable of bending and this bed has bent to the extent of $4\frac{1}{2}$ deg. per inch. The flexibility of the mudstone is due to the high percentage of mica and to the lamination, which allowed the laminæ to slide over each other and shear. The effect of the shearing has been a development of slickensiding along the planes of lamination and a drawing out of the particles.

## WAXWINGS IN THE WEST RIDING.

It is rather a curious fact that we should have more records of Waxwings this season in this district than in the great invasion of a year ago. Mr. R. Butterfield informs me that two Waxwings were in a Rowan or Mountain Ash tree on November 22nd and 23rd at Higher Utley, a suburb of Keighley. They were in the garden of Mr. Rishworth, and took very little notice of traffic, etc., but spent most of their time dozing or preening—occasionally dropping to the ground for a fallen berry. Another was seen at close quarters at Shipley on November 29th. The Rev. C. F. Tomlinson informs that a small flock of six or eight birds were seem just after the middle of November in the Deep Park, Bolton Abbey, close to where one was killed by a Hawk a year ago. The same, or a similar, flock were seen at the same place on December 2nd, and were feeding on haws. It is strange that they turn up suddenly in November and disappear in December to nobody knows where.—H. B. Booth, Ben Rhydding.

## BRITISH WILLOW TIT IN YORKSHIRE.

At a recent meeting of the British Ornithologists' Club, Mr. H. F. Witherby stated, on the authority of Mr. A. Hazelwood, of Doncaster, that the British Willow Tit (*Parus atricapillus kleinschmidti*) was common around Doncaster, and that it nested there freely.—H. B. Booth.

## REVIEWS AND BOOK NOTICES.

**The Form and Properties of Crystals,** an Introduction to the Study of Minerals and the use of the Petrological Microscope, by **A. B. Dale.** This book has been written for first-year students doing Mineralogy and Crystallography, most of the existing elementary text-books on this subject being expensive. The writer's object is to introduce students of geology to the minimum knowledge of Crystallography and Physics (more especially Physical Optics) which it is essential they should possess, if they are to have any intelligent notion of what they are doing when they study thin slices of rocks under the microscope. Cambridge University Press, 186 pp., 6/-.

**Insect Behaviour,** by **Evelyn Cheeseman.** Philip Allen & Co., Ltd., 1932, pp. 186, 4/6 net. This is a well-written account of insect behaviour for the 'Man in the street.' It is pointed out that, owing to their immense antiquity, insects have reached a high stage of development. Their actions are governed by hereditary instincts and not by intelligence. Numerous examples of these instincts are given. Instinctive behaviour, however, can be varied by an alteration of circumstance and there are such actions as 'blind trials.' There is also a seeming awareness of failure and danger which may cause an alteration in behaviour, and certain insects apparently are able to learn by experience. Insects come into the world predisposed to a distinct mode of behaviour, inherited through natural selection and though there is a latent faculty to vary behaviour, there is no evidence of a conception of ultimate aim. Influences in the environment evoke an appropriate response, the action being prompted by outside stimuli. Tropisms have to do with ordinary every-day needs and are of various kinds, such as heliotropism, thermotropism and chemotropisms. There is also a certain amount of periodicity of behaviour which has become stereotyped and can act without the appropriate stimulus as when a diurnal insect becomes active in the daytime even though kept in the dark when the normal stimulus of light is absent. The instincts of the parent in the preparation for the next generation are frequently most complicated and are discussed in this work with interesting detail. The author is to be congratulated on having produced a most readable and instructive little book.

# THE YORKSHIRE NATURALISTS' UNION'S SEVENTIETH ANNUAL REPORT

## FOR 1932

(*Continued from page* 24).

## ENTOMOLOGICAL SECTION (*continued*).

An interesting collection of material is at present being worked upon from just outside the Yorkshire boundary collected by Mr. Pentelow, and it contains such good species as *Rhithrogena fraglyi*, which is a species not yet recorded in Yorkshire.

Some of the results of the investigations into the Yorkshire Mayfly fauna during 1931 made by Mr. Hincks and myself, appeared in *The Naturalist* for February, 1932, and included three additions to the Yorkshire list, but much of the information which we obtained could not be placed in a short paper of this description.

A large number of records from a wide range of Yorkshire localities have been obtained this year together with some biological observations, which may prove of interest, and we hope to be in a position to put these on record.

Mr. Hincks took a female *Rhithrogena* at West Tanfield last year, which, we believe, will prove to be an addition to the British List. Unfortunately, this cannot be determined for certainty without further materials, but it appears to be amply distinct from *R. fraglyi* and *R. semicolorata*.

At Ryhill, on the Entomological Section's field meeting in June, the cast pellicles of *Caenis macrura* were noticed upon trees near the water and there followed a search for the nymphs which were found in numbers beneath algal growth at the edge of the reservoir. These nymphs were difficult to see owing to their resemblance in colour to the reservoir bed.

No additions have as yet been made to the Yorkshire list during 1932.

Our knowledge of Mayfly nymphs and their determination is exceedingly poor, and a good deal of time has been spent in collecting and observing Yorkshire specimens in the nymphal state. The following three species : *Caenis macrura*, *Cloeon dipterum* and *Ecydonurus venosus* have each been captured as fairly well developed nymphs and successfully kept until emergence of the adult. Other species have been taken in the nymphal state, but have succumbed in our aquaria either through inadequacy of the aeriation of the water or of their food supply.

Mr. W. Withell has done some good work by supplying some excellent photographs of wing slides.

I have received good material from Mr. W. Doughty and Mr. A. G. Davies, who are keen Yorkshire fly fishermen.

A list of records for 1932 is appended, together with a reference to those who have contributed to form it. Attention is drawn to the probable increase in this list when the remaining material which has been sent in is worked out.

*NOTE*.—At the Annual Meeting to-day, Mr. J. Wood has handed in a very excellent collection of material to be worked up, which will increase the list of records in due course.—15/10/32.

### List of Records for 1932.

*Ephemera danica* Mull. ... Harewood Bridge, 13.6. A few specimens only seen, and one male and one female captured.

Meanwood Beck, Leeds, 16.6. Seen in thousands swarming both sexes, flying from the beck in evening up road. (W. W.) 20 specimens sent to me.

| | |
|---|---|
| *Ecydonurus venosus* F. ... | West Tanfield, R. Ure, 29.5. Males swarming, and both sexes hatching out from river all day. (J. R. D.) |
| | Harewood Bridge, 11.6. Not abundant. |
| | Harewood Bridge, 13.6. Not abundant. |
| *Heptagenia sulpphurea* Mull. | Harewood Bridge, 13.6. Fairly common. |
| *Rhithrogena semicolorata* Curt. | Pateley Bridge, 22.5. Scarce. (W. D.) |
| | West Tanfield, 29.5. Few only. (J.R.D.) |
| | Harewood Bridge, 11.6. Common. (W. D.) |
| *Baetis pumilus* Burm. ... | Harewood Bridge, 28.5. Not common. |
| *B. rhodani* Pict. ... ... | Cowthorpe, 17.4. One male. (W. D.) |
| | Low Laithe, near Summerbridge, 7.5. Scarce. (W. D.) |
| | Pateley Bridge, 22.5. Few only. (W. D.) |
| | Scarcroft, 26.5. Not common. |
| | West Tanfield, 29.5. Scarce. (J. R. D.) |
| *B. bioculatus* L. ... ... | Harewood Bridge, 13.6. Very abundant. |
| *Chloeon rufulum* Mull. ... | Ryhill, 1.5. Well-grown nymphs. |
| | Ryhill, 25.6. Adults very common. |
| *Habrophlebia fusca* Curt. ... | East Cottingwith, R. Derwent, August. (W. D. H.) |
| *Leptophlebia marginata* L. ... | Ryhill, 14.5. One male. (J. R. D.) |
| *Paraleptophlebia submarginata*, Steph. | Pateley Bridge, 22/5. Few only. (W. D.) |
| | Meanwood Beck, Leeds, May. (W. D. H. and G. N.) |
| *Leptophlebia vespertina* L. ... | West Tanfield, 29.5. One male sub. (J. R. D.) |
| *Ephemerella notata* Eaton. ... | Cowthorpe, 17.6. Two males. (A. G. D.) |
| *Caenis rivulorum* Eaton. ... | Harewood Bridge, 13.6. Adults common |
| *C. macrura* Steph. ... ... | Ryhill, 25.6. Nymphs common. Hatched out in captivity end of June. |

Reference to Contributors to Above Records.

*NOTE.*—Records not otherwise acknowledged, made by W. D. Hincks and J. R. Dibb.

| | |
|---|---|
| (G. A. N.) ... ... ... | G. Nelson. |
| (W. D.) ... ... ... | W. Doughty. |
| (A. G. D.) ... ... ... | A. G. Davies. |
| (W. W.) ... ... ... | W. Withell. |
| (W. D. H.) ... ... ... | W. D. Hincks. |
| (J. R. D.) ... ... ... | J. R. Dibb. |

**Hemiptera** (J. M. Brown, B.Sc.) :—Very little of special interest has been noted among the Hemiptera during the past season. Individuals seem to have been scarce, notwithstanding the sunny time during August, and the species taken have been mainly quite common ones. A visit to Allerthorpe Common during August was, unfortunately, spoiled by rain, but supplied a single specimen of *Piezodorus lituratus* F., a species reputed to be plentiful wherever gorse flourishes, but actually very local in the county, having been taken in two or three places only, and those chiefly on the coast. At the same time three species of *Idiocerus* were taken, viz. *confusus* Flor., *lituratus* Fall., and *fulgidus* Fab., this last

an uncommon one. In Goredale, also during August, *Temnostethus pusillus* H. S., and a species of *Deltocephalus* not yet identified with any of our local forms, were obtained. *Lygus rubricatus* Fall, and *Atractotomus magnicornis* Fall., were plentiful on Scots Pine at Winterburn, where also occurred *Lygus cervinus* H. S., and *Orthotylus viridinervis* Kb. The Scale-insect, *Lecanium capreae* (L.), was noted on hawthorn at Sedbergh. *Deltocephalus sabulicola* Curt. is reported by Mr. M. L. Thompson from the north-east coast.

**Neuroptera** (J. M. Brown) :—Among common species taken during the summer may be noted *Hemerobius stigma* Steph. from Allerthorpe, *Boriomyia subnebulosa* Steph. from Ryhill, *Chrysopa vittata* Waes. from near Sheffield, and the minute *Semidalis aleurodiformis* Steph. from Winterburn, Ryhill and Sheffield, and with this last the form *curtisiana* End.

**Plecoptera** (J. M. Brown) :—A considerable amount of collecting has been done among the Stoneflies, and a number of new vice-county records can be given. *Amphinemura standfussi* Ris. and *Leuctra moselyi* Mort., noted for the first time in last year's Report, were taken again this year at Winterburn (V.C. 64), *Capnia nigra* Pict. and *Nemurella inconspicua* Pict. occurred near Sheffield (V.C. 63), *Leuctra nigra* Pict. was obtained at Sedbergh (V.C. 65) and near Sheffield, while the rare *Capnia vidua* Klp. occurred near Muker (Swaledale).

**Psocoptera** (J. M. Brown) :—The most interesting species obtained during the season is the apterous *Hyperetes guestfalicus* Klbe. taken at Winterburn, which, I believe, is the first county record.

**Plant Galls** (J. M. Brown) :—While galls have been collected on most of the Union excursions, few of particular interest have been noted. At Sedbergh, Mr. Mason gathered the interesting root-gall on the oak, due to *Biorrhiza pallida* Oliv. f. *aptera*, the alternate generation to the common Oak-Apple gall wasp. In the neighbourhood of Skipton, *Stictodiplosis scrophulariae* Kieff., deforming the flower buds of the Figwort, was rather plentiful, and on Flasby Fell *Molinia cœrulea*, as noticed first by Mr. Malins Smith, was commonly attacked by *Mayetiola ventricola* Rubs.

In *The Naturalist* for November, Mr. Falconer published a list of Galls obtained in the North and East Ridings.

**Coleoptera** (M. L. Thompson) :—From the reports which have so far reached me it appears that beetles have been scarce during the past season both with regard to species and individuals. Members of the Coleoptera Committee attended the meetings of the Union at Saltburn, Skipton and Sedbergh, also the Sectional Meeting at Ryhill Reservoir. A few new localities for some interesting species may be mentioned. Mr. E. G. Bayford captured a specimen of *Blethisa multipunctata* L. at Bolton Ings, Bolton-on-Dearne. Mr. W. J. Fordham records *Harpalus æneus* var. *cærulescens* Schil., from Allerthorpe Common in 1931, and *Otiorrhynchus rugosostriatus* Goezes., from Barmby Moor in 1931. Mr. T. Stainforth has again taken *Donacia* (*Plateumaris*) *braccata* Scop., on *Phragmites* in a ditch near the River Hull. *Agabus femoralis* Pk. was found in a large pool below Cronkley Fell in Upper Teesdale in May. Mr. J. Wood met with *Bryocharis* (*Megacronus*) *cingulata* Man., in Sunnydale, Morton, near Shipley, and a fine specimen of *Aromia moschata* L. at Askham Bog, York. Mr. Geo. B. Walsh has found specimens in his collection of *Bembidion redtenbacheri*, which were taken at Scalby Beck, near Scarborough and Bridlington. This species was brought forward as a British insect by Dr. Joy, who took a few specimens on the banks of a stream near Sheffield in 1925.

Specimens in my own collection are from Lockwood Beck Reservoir,

near Guisborough; Redmire in Upper Wensleydale; and Keld in Upper Swaledale.

**Hymenoptera** (Rosse Butterfield): Aculeata Hymenoptera.—The summer months were apparently decidedly more favourable than the corresponding months of the past two or three years, but, nevertheless, insects of this group have been far from common. This may be due to a relatively few number of pupæ due to emerge this year. The number of last year's mud nests of *Odynerus* on walls, rocks, etc., was lower than I have known for twenty years.

*Andrena clarkella* appeared on Austwick Moss as early as March 25th, but no *Nomada* inquilines were noticed about its burrows. Mr. W. J. Fordham saw this species and *Nomada leucopthalma* on April 27th at Allerthorpe. *Andrena sericea* proved the most abundant spring bee. A variety of *A. chrysosceles* occurred on raspberry bloom near Coniston in early July. I doubt whether the nest of *Bombus soroensis* has been found or recorded in this country, and on August 18th I took an opportunity, when in Grass Wood, of examining one under a root of beech near the surface. The nest, a little larger than a cricket ball, was formed of cut, dry fine grass, with strands of sheep's wool worked in the lining. I was disappointed in not finding *Psithyrus distinctus* var. *subrufipes*, which is supposed to be its inquiline. An interesting find was the curious and rare *Rhopalum tibialis* Fab., near Ryhill, in June. Both Mr. J. Wood and I secured examples of both sexes. Mr. Fordham found males of *Andrena fucata* at Allerthorpe on June 16th, and it has been seen in two or three places in the West Riding.

**Lepidoptera: York District** (A. Smith):—Sallows did not offer much material in the spring, perhaps the best things coming to the bloom were *T. populeti* one specimen, *P. rubricosa* and *T. munda* more freely. *T. pulverulenta* plentiful. The cold about this time kept larvæ back, and not till early June did the Sallow-feeding larvæ show much signs of getting any larger. On the 8th June I took a number of *X. fulvago* larvæ only a quarter of an inch long; this time last year they were full fed. *C. viminalis* larvæ were plentiful in the various Sallows growing in the Strensall area; the same day *H. tenebrata* were flying in the afternoon by the roadside.

On Strensall Common during the evening of June 11th Fox Moths were flying in numbers and kept on doing so in spite of a thick ground fog setting down, obliterating everything from view. Nothing else was flying during the fog.

One of my best captures of the season were two specimens of *E. punctaria* (Maiden's Blush) at Buttercrambe on June 14th, one a slightly-worn male, the other a fine female. This is the first time I have seen the species in Yorkshire.

At Newton Dale on June 25th quite a number of interesting butterflies were in evidence. *N. lucina* plentiful, females mostly and getting a bit worn, this date being rather late for them. *L. astrarche* were in fine fresh condition and numerous *A. selene* and *A. euphrosyne* were both flying about. *L. ægon* was as plentiful as usual. *A. candidata* fairly common among the Hazel, but the best capture of the day was a specimen of *N. pulveraria* (Barred Umber) by Mr. Head, of Burniston. This insect has not before been recorded in our York area. Larvæ of *B. sphinx* were beaten from an oak tree. This is also interesting as the insect has not been found by many of our Yorkshire collectors and, up to this record, has not been found in our area except by the Rev. C. D. Ash, somewhere near Tadcaster.

On June 29th at Buttercrambe I took a specimen of *H. albicillata* and a caterpillar of *T. crataegi*; two *crataegi* larvæ occurred at Newton Dale in 1931, both unfortunately ichneumoned. I have not heard of this species before in our area.

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July 1st.—One specimen of *leporina* (Miller) at rest on Pine tree at Strensall.

July 3rd.—At Helmsley I took a specimen of *A. bloomeri*, another Yorkshire locality for this species.

July 6th.—Four miles from York on the Malton Road, I beat off oak two larvæ of *N. chaonia*. Several *E. obliterata* were caught flying among the Alders.

July 9th.—I sugared at Buttercrambe, the more interesting captures were one specimen of *E. prasina* (The Green Arches), one *N. triangulum*, one *T. batis*, three *N.C. nigrum*, several *M. strigilis*. *Prasina* is very rare in the York District.

July 10th.—Larvæ of *C. prunata* in garden at Huntington.

July 11th.—Forge Valley, near Scarborough, *A. bloomeri* not scarce but difficult to catch, mostly sitting up high on the Beech trunks. *V. cambrica* were also about, but like *bloomeri* did their worst to avoid capture.

July 18th.—At Langdale End, Scarborough, *A. aglaia* were fairly plentiful, although a windy cold day they were flying over the long grasses; nothing but males were seen. I took a nearly full-fed larvæ of *V. cambrica* the same day, also larvæ of *E. minutata* and *E. nanata*.

August 24th.—At Strensall larvæ were plentiful; among the bag were *L. camelina*, *N. dictaeoides*, *N. dromedarius*, *N. ziczae*, *A. betularia*, and *T. firmata*.

September 8th.—Larvæ of *A. leporina* at Strensall on Birch.

September 11th.—Cawood. One larvæ of *M. persicaria* feeding on garden daisies in a garden near the Bridge; in the same garden larvæ of *P. forficalis* had simply riddled the leaves of the Horse Radish; a few caterpillars of *M. fluctuata* were struggling to live on the same plants. Our well-known and local *E. vespertaria* has almost suffered extermination owing to the undergrowth having been burnt, all the Dwarf Sallow was reduced to ashes, so no ova could possibly exist under such conditions; the insect is rarely found far from this patch and no record of the insect has reached me yet for 1932.

## CONCHOLOGICAL SECTION.

**Mollusca** (Elsie M. Morehouse):—The year 1932 can be noted by a great improvement in the molluscan world. The past few years the conditions have not been in favour of these little animals. In several habitats under observation there has been a distinct improvement in respect of numbers; in others the upward grade leaves a great deal to be desired. If in 1933 the present conditions are maintained, it is to be hoped those species which were practically gone will have fully recovered.

It is hardly fair to judge the molluscan fauna in the different places where meetings have been held, because they are very sensitive to climatic conditions and it is not always possible to be out at dusk or later when they are feeding.

Those molluscs worthy of mention or common species taken in unusual habitats were *Limnæa peregra* taken from the swift-running becks around Sedbergh. In these becks the aquatic plants were practically nil. *Vitrea radiatula* found on stones near a farmhouse, on the way to Carling Gill. *Arianta arbustorum* found on Black Force at an altitude of 1,000 feet. The different *Limnæa* taken from drains, etc., around Ferrybridge on June 4th, the shells were unusually frail, evidently due to insufficient lime. Only one *Paludestrina stagnalis* was found when dredging in the Market Weighton Canal on June 28th; this is very unusual. *Paludestrina jenkensi* and sub-species are invariably local, but where they occur there are vast quantities. Another habitat has

been found at Almholme, near Doncaster, for the three molluscs which associate together *Aplecta hypnorum*, *Limnæa glabra* and *Planorbis spirorbis*. At another place at Almholme a very small grip in a grass lane was full of *Planorbis spirorbis*, quite 70 per cent. being distorted. Some very curious forms were found during our first visit. A colony of *Helicella itala* was found by the edge of a limestone quarry, Kirkdale Woods, Kirby Moorside.

Slugs have not been nearly so plentiful this year, a few isolated places have produced quite the average amount. Mr. Kenneth Howell found *Arionater v. fasciata* in Saw Woods, Leeds, and a very fine specimen of *Limax maximus v. sylvatica* which he took at Kirk Smeaton, its measurement when fully extended being $8\frac{7}{8}$ inches. I believe this constitutes a record for length.

## BOTANICAL SECTION.

(Chris. A. Cheetham) :—This section meets under the shadow of a great loss. Mr. Jo. Beanland will long be missed when the distribution of any Yorkshire plant is under discussion, and his cheery voice and helpful suggestions will be heard no more at these meetings he liked so well. We shall only realise our loss as time goes on and his knowledge is wanted in our discussions.

Another loss to Yorkshire botanical knowledge is that of an associate of the Union, Mr. H. H. Sturdy, of Settle. He was less known to our members than he was to botanists who visited the district he knew so well. They will find the gap he has left when they come again to Craven.

The year has been more normal in all respects than the past two, and the results appear somewhat uninteresting owing to this general average of weather, flowering and fruitage.

January and February gave promise of a very early spring, and Celandines were reported in flower during the first week or two of the year. Coltsfoot and Primroses were in bloom at the commencement of February, and even the Alpines were early. *Hutchinsia* was in flower January 25th, and *Saxifraga oppositifolia* on February 27th. The promise of an early spring was not kept, however, and March, April and May were cool and sunless, so that spring flowers were, on the whole, a week or two later than usual.

A general impression of the flowering would be that it was a good display, but it did not last very long. The meadow Buttercups made a striking show, and it was suggested in some cases that they were better seen this year than is usual owing to the late growth of the grass crop. The Heather made a fine show of colour, but did not last very long. One curious result of the check to growth due to the cold spell in spring was seen in Colt Park Wood at the end of June, the fern leaves, most particularly those of *Filix mas*, had a pale green margin, varying up to an inch in width, very distinct from the normal dark green of full growth as if there had been a distinct check and maturing of the early growth and then a sudden recommencement of growth when the warm dry spell came in June.

Coming to the results as shown by the fruitage, few seem very good from all districts ; perhaps the Wild Rose, Raspberry and Mountain Ash might be put in this class. Then follow the Elderberry, Sycamore, Beech and Ash, the last-named seems poor near Bradford and Huddersfield, but in Craven many trees are full of fruit, though, as is usually the case, there are many quite bare, and this may be owing to a tendency to become a dioecious species, and these to be male plants. The Oak came into leaf two or three weeks before the Ash, but it has produced a very poor crop of fruit in most districts. Hawthorn is very uneven,

occasional bushes with plenty of berries, but the greater number without. The Bramble crop is far better than that of the last two years, and Raspberries have done very well. Apples, Pears and Plums are only moderate, Sloes and Damsons almost absent.

The season seems to have produced a normal growth of all species of orchids, none being reported as failing or making special displays. Mr. A. Malins Smith mentions a patch of *Habenaria chlorantha* flowering, which had been watched and had not produced flowers since 1914; he also cites the abundance of Ash seedlings as an outstanding event of the year.

Mr. W. B. Haley states that *Epilobium angustifolium* is over-running the ground which was so full of interesting aliens, though a few are still holding their own.

The consensus of opinion is that secondary growth has not been so noticeable this year, but statements vary widely, and this may be due to various causes. Some definite trees will be found to always show this type of growth, and if they are carefully examined it will generally be found that there has been disturbance of the original growth at some time or other. Perhaps a broken branch years ago, or pruning and clipping this year, or insect attack during spring—any such like matters will cause the production of a type of secondary growth.

**Flowering Plants** (W. A. Sledge, Ph.D.) :—The task of drawing up this report on the flowering plants for the past season, during which many notable records have been made, has been lightened by the kindness of those members who have forwarded their records to me, and I should like to thank them for their help.

From the North Riding, Mr. R. J. Flintoff, sends me records for *Rynchospora alba* L. Vahl. found by Dr. H. Arathoon at Lilla Cross; *Crepis biennis* L., found by W. C. Worsdell, James Green and R. J. Flintoff at Allerston, near Pickering; and *Asplenium lanceolatum* Huds. found by Mr. Francis Druce near Goathland. Mr. Flintoff also records *Hieracium sagittatum* Lindeb. var. *subhirtum* Hanb. (teste K. Zahn) from Riccaldale, and a Dandelion collected by him at Grosmont has been identified by Dr. Dahlstedt as *Taraxacum brachyglossum* Dahls. Early in the season Miss K. Rob found *Asperugo procumbens* L. in some quantity in a stackyard at Topcliffe, near Thirsk, where she showed it to me. We also collected *Pyrus scandica* Fr. at Pilmoor; it has long been known to grow there, but is unrecorded in Baker's *North Yorkshire* and the *Comital Flora of the British Isles*. Mrs. T. J. Foggitt and I also collected a batrachian *Ranunculus* at Thirsk, which Mr. W. H. Pearsall identified as *R. heterophyllus* Weber. var. *trifidus* Pearsall.

From the West Riding Mr. N. Frankland records *Peucedanum sativum* L. from near Gisburn, and our late regretted member, Mr. H. H. Sturdy, shortly before his death had noted that the prevailing Water Plantain in the Leeds and Liverpool Canal in the Craven area is *Alisma plantago-aquatica* L. var. *lanceolatum* With. Early in July I spent a week at Austwick, and the visit yielded *Carex diandra* Schrank. and *C. panicea* L. var. *tumidula* Læst., the former a most welcome record in view of the very few, old and vaguely localised records for the species in the *Flora of West Yorkshire*. The record for this plant at Malham Tarn quoted in the *Flora* is open to grave doubt. Further investigations were made on the marsh and spotted orchids of the district, and the following species, varieties and hybrids are now known to occur in the neighbourhood: *Orchis incarnata* L., *O. incarnata* L. var. *pulchrior* Dr., *O. praetermissa* Dr. var. *pulchella* Dr., *O. purpurella* Steph., *O. elodes* Griseb., *O. elodes* Griseb. var. *leucantha* (Dr.) *O. elodes* Griseb. × *O. praetermissa* Dr. var. *pulchella* Dr., *O. Fuchsii* Dr., and *O. Fuchsii* Dr. × *O. praetermissa* Dr. var. *pulchella* Dr. *Purpurella* hybrids probably occur, too, but have not yet been identified with certainty.

Other new or noteworthy native Yorkshire plants recorded in the current report of the Botanical Society and Exchange Club include : *Erophila boerhaavii* van Hall Dumortier var. *fraseri* O.E. Schulz var. nov. from Sawley, near Clitheroe, V.C. 64, and *Erophila boerhaavii* van Hall Dumortier var. *inflata* H. C. Wats. O. E. Schulz. from the summit of Ingleborough, V.C. 64, both collected by Mr. C. G. Trapnell ; *Viola hirta* L. × *V. odorata* L. and *Hieracium chlorophyllum* Jord. var. *calvescens* Zahn., both from Outershaw, V.C. 64, collected by the late Dr. G. C. Druce ; *Campanula rotundifolia* L. var. *fissa* Dr. var. nov., from Winterburn, near Skipton, V.C. 64, collected by Mr. A. Turner ; *Campanula rotundifolia* L. var. *linearifolia* Dum. Hayek., from Outershaw and Coniston Cold, V.C. 64, and *Carex lepidocarpa* Tausch., from Winch Bridge, Teesdale, V.C. 65, both collected by the late Dr. G. C. Druce.

Amongst the alien species recorded, Mr. Flintoff notes *Stachys annua* L. from Dalby Marwood ; *Stachys grandiflora* L., found by Mr. J. Green, of Thornton Dale ; *Saponaria vaccaria* L. from near Driffield, collected by Major Lawson, and *Erigeron acre* L. found by Miss Ingham at Grosmont. Some interesting aliens have been found by the late Mr. H. H. Sturdy and Mr. N. Frankland in the Settle area, including *Brassica gallica* Willd. Dr., *Lepidium virginicum* L., *Vicia pannonica* Crantz. var. *striata* M. Bieb., *Lathyrus aphaca* L., *Potentilla norvegica* L., *Caucalis daucoides* L., *Linaria purpurea* Mill., and *Leucojum vernum* L. In September I paid another visit with Mr. J. Kendall to the Olympia sidings at Selby, where, in addition to the aliens recorded from this locality in last year's report, the following plants were collected : *Ipomoea hederacea* (new to Britain), *Chenopodium murale* L. var. *microphyllum* Gürcke., *C. aristatum* Asch. (new to Yorkshire), *Polygonum petecticale* Stokes, *Fagopyrum sagittatum* Gilib., *F. tartaricum* L. Gaertn., *Panicum miliacium* L., and *P. crus-galli* L.

**Bryological Committee** (F. E. Milsom, B.Sc.) :—Judging by results, the Bryological Section may claim to have had a very successful year.

Although the sectional meeting arranged for Easter had to be abandoned owing to lack of support, much keenness has been shown during the year by members of the section, and it would seem, on reviewing the past few years, that bryology in Yorkshire is tending to depend more on individual than on concerted effort.

Dealing first with new records, there are the following :—

Mosses.

*Schistostega osmundacea* Mohr. (new to V.C. 65).

*Orthodontium gracile* Schwaeg. var. *heterocarpum* Wats. (new to V.C. 62).

*Heterocladium heteropterum* B. and S. var. *fallax* Milde (new to V.C. 63).

*Hypnum lycopodioides* Schwaeg. (new to V.C. 63).

The *Orthodontium* is an interesting extension of its range in Yorkshire. It is of interest to note that the variety has now been found in V.Cs 62, 63, 64 and 65, also in both the Yorkshire and the Staffordshire side of Cheshire, and in Staffordshire.

Hepatics.

*Aplozia pumila* (With.) Dum. var. *rivularis* Schiffn. (new to V.C. 63).

The following notes were added on species which, though not new Vice-Comital records, are interesting for various reasons.

Mosses.

*Tetraphis pellucida* Hedw. Found in fruit at East Witton (V.C.65).

*Swartzia inclinata* Shoh. Confirmed for V.C. 64 by its discovery near Helwith.

*Dicranella squarrosa* Schp. Found in fruit near Ingleby Greenhow (V.C. 62).

*Fissidens rufulus* B. and S. Confirmed in fruit in its station in River Wharfe (V.C. 64).

*Leptodontium flexifolium* Hampl. Found in fruit on Moughton (V.C. 64).

*Trichostomum mutabile* Brach. var. *lophocarpum* Schp. Found in fruit in V.C. 64.

*T. tortuosum* Dixon. Found in fruit in V.C. 64.

*Orthodontium gracile* Schwaeg. var. *heterocarpum* Wats. Found at Pateley Bridge, Nidderdale, and Appletreewick, Wharfedale.

*Zygodon lapponicus* B. and S. Confirmed on Ingleborough (V.C. 64).

*Myurella julacea* B. and S. Confirmed on Ingleborough (V.C. 64).

Hepatics.

*Ptilidium pulcherrimum* (Web.) Hampl. A welcome confirmation of its presence in V.C. 64, by its discovery at Eldroth.

*Marchesinia Mackair* (Hook) Gray. Confirmed in Ingleton Glens by its discovery in plenty in another habitat from than in which it was originally found.

In conclusion, emphasis is placed on the appeal made last year that old records of rare mosses should be followed up in order that definite information can be available as to which of the rare species can be considered extinct in the county.

**Ecological Committee** (Miss D. Hilary, B.Sc.) :—Two meetings have been held, one at Skipton on the occasion of the Annual Meeting, and the other a field meeting, May 7th. A second field meeting arranged in October did not take place owing to the impossible weather conditions. At the May Meeting the plots which last year were staked out on Moughton Fell for the investigation of the degeneration of the Juniper Scrub, were revisited and a few new records made. Another plot was entirely cleared of vegetation so that any invasions may be recorded in subsequent visits. Several exposures were made in the Juniper Valley, and the nature of the soil and the acidity at different depths was recorded. It is hoped later to obtain a more detailed record of soil analysis and acidity.

**Mycological Committee** (Dr. J. Grainger) :—The Committee has continued its activities during the year and has been represented on each of its general excursions. Its annual Foray was held at Kirby-moorside from September 17th-22nd, when excursions into the valleys which run northwards to the moors were arranged, and a large number of species was collected. The Chairman, Mr. J. W. H. Johnson, M.Sc., F.I.C., presided over the Annual Meeting held on the 17th, when Mr. A. E. Peck was elected Chairman for the ensuing year. Miss K. Moorhouse was elected a member of the Committee ; the Hon. Secretary, Representative on Executive, and Recorder being severally re-elected.

## GEOLOGICAL SECTION.

**Glacial Committee** :—Renewed attention has recently been paid to the coast sections in Holderness, and Hull members have been active in a re-examination of the Boulder Clays from a stratigraphical aspect. A new classification of these clays has recently appeared in *The Naturalist* from the pen of Mr. W. S. Bisat, and members are invited to test the validity of his conclusions on the coast and in inland sections.

**Temporary Sections** :—Very little information has been sent to the convener. Excavations in building operations at Moortown, Leeds, have enabled the Boundary Fault of the Coalfield to be mapped in an area where exposures are limited.

**Geological Photographs** :—The convener has continued his work on East Yorkshire sections, particularly Glacial sections. An appeal is made to affiliated societies to take part in the photography of natural features in their own area, and to send a copy of their photographs to the convener for incorporation in the Union's collection. The re-photography of sections, after many years interval, may be of considerable value to studies of erosion, so that old negatives and prints have still a value in this connection.

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" **The Naturalist** " has appeared regularly each month and, despite some reduction of pages through financial considerations, its standard has been well maintained. Many of the illustrations which have greatly enhanced its pages, have been paid for by the authors of papers, while some have been included by the courtesy of the Hull Corporation. The Executive regrets to record the resignation of the Editor, Mr. Thos. Sheppard, M.Sc., F.G.S., who has conducted the journal since 1903, and in recognition of his valuable services a Presentation is to be made, for which contributions have been received from a large number of members, associates, and friends of the Union.

In view of the many difficulties and expenditure of time involved in the production of a monthly journal like *The Naturalist*, the Executive has much satisfaction in being able to announce that in future the publication of *The Naturalist* will be in the hands of Dr. W. H. Pearsall, F.L.S., Botany Dept., and Mr. W. R. Grist, B.Sc., Appointments Board, of the University, Leeds, as Joint-Editors.

**Gift to Leeds University.**— Mr. T. Sheppard has handed over to the University at Leeds his collection of authors' reprints and pamphlets relating to the geology, natural history and archæology which principally relate to Yorkshire. He has also handed over his material for a history of Yorkshire scientific societies, upon which he had been at work for some time, and this includes the syllabuses, lists of members, excursion programmes, annual reports, etc., of practically all the natural history societies and field clubs in the County from their beginning. Many of these societies are now not in existence, hence the record is a particularly valuable one. These are from Mr. Sheppard's private collection.

In addition there is a large quantity of notebooks and other records relating to the work of the Yorkshire Naturalists' Union which were handed over to Mr. Sheppard by the Executors of the late J. W. Taylor, the late W. Denison Roebuck having given them to Mr. Taylor before his death. It is thought that this collection had better be housed in the University, where it will be available to any members of the Union interested.

**Soppit Memorial Library.**—Dr. T. W. Woodhead, M.Sc., F.L.S., has been re-elected Librarian.

**Delegate to the British Association** and to the Plant Conservation Board of the Society for the Preservation of Rural England, Mr. T. Sheppard.

*1933 Feb. 1*

## INCOME & EXPENDITURE ACCOUNT to Oct. 31, 1932.

### INCOME.

| | £ s. d. | £ s. d. |
|---|---|---|
| Members' Annual Subscriptions, arrears | 17 13 0 | |
| ,, 1932 | 57 8 6 | |
| ,, 1933 | 0 16 0 | |
| | | 75 17 6 |
| Levies from Affiliated Societies, arrears | 2 8 7 | |
| ,, 1932 | 8 12 2 | |
| | | 11 0 9 |
| 'Booth' Fund for printing | | 3 10 0 |
| Interest on 4% Consols | 5 18 0 | |
| ,, 4½% Conversion | 7 13 8 | |
| ,, 5% War Loan | 5 0 0 | |
| ,, Bank ... | 0 4 8 | |
| Bonus on Conversion of 5% War Loan ... ... | 1 0 0 | |
| | | 19 16 4 |
| *Naturalist*— | | |
| Subscriptions, arrears | 35 0 0 | |
| ,, 1932 | 111 0 0 | |
| ,, 1933 | 1 0 0 | |
| 'Cheesman' Fund for Illustrations... ... | 5 0 0 | |
| Bonus on Conversion of Cheesman Fund ... | 1 0 0 | |
| | | 153 0 0 |
| Balance of Expenditure over Income... | | 4 6 5 |
| | | £267 11 0 |

### EXPENDITURE.

| | £ s. d. | £ s. d. |
|---|---|---|
| Expenses of Meetings— | | |
| General Expenses ... | 0 14 3 | |
| Secretaries' Stationery | 1 14 0 | |
| | | 2 8 3 |
| Printing and Stationery (General A/c) | | 49 14 1 |
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| ,, arrears 1930-31 | 13 10 0 | |
| Binding ... | 1 16 0 | |
| Extra Pages ... | 6 13 6 | |
| Editor's Postages ... | 9 0 0 | |
| | | 201 15 3 |
| Sundry Expenses— | | |
| Bank Charges ... ... ... | | 1 19 1 |
| Income Tax ... ... ... ... | | 5 10 0 |
| Wreaths ... ... ... ... | | 2 0 0 |
| | | £267 11 0 |

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### LIABILITIES.

| | £ s. d. |
|---|---|
| *Naturalist*, etc. ... ... ... | ... 113 10 9 |
| Subscriptions paid in advance | ... 1 16 0 |
| Life Members' account ... | ... 323 8 0 |
| Balance of Assets over Liabilities | ... 151 10 6 |
| | £590 5 3 |

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*Hon. Treasurer.*

### ASSETS.

| | £ s. d. | £ s. d. |
|---|---|---|
| Cash at Bank ... ... ... ... | | 54 12 4 |
| ,, in hands of Treasurer ... ... | | 7 17 11 |
| £200 4% Consols, value at date | | ... 216 10 0 |
| £170 16s. 9d. 4½% Conversion | | ... 179 0 0 |
| £100 5% War Loan ... ... ... | | 99 5 0 |
| | £ s. d. | |
| Subscriptions in arrears | 62 10 0 | |
| Written off as unrealizable | 29 10 0 | |
| | | 33 0 0 |
| 'Booth' Fund, £100 3½% Conversion Loan. | | |
| 'Cheesman' Fund, £100 5% War Loan. | | |
| Audited and found correct, *November* 12th, 1932. | | £590 5 3 |

CHRIS. A. CHEETHAM, } *Hon. Auditors.*
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## NORTHERN NEWS.

At a recent meeting of Hull naturalists, Mr. C. M. Holt exhibited a 'silver-striped Hawk Moth,' said to be the first caught in the district since 1864.

The death is announced of H. Knight Horsfield, for many years natural history editor of the *Yorkshire Weekly Post*. He was an authority on bird life and a member of the British Ornithological Union.

Mr. Ludwig Glauert, formerly of Sheffield, and now the Curator of the Perth Museum, Australia, sends us a number of copies of *Our Rural Magazine*, issued by the Education Department of Western Australia, in which are various natural history notes from his pen.

*The Naturalist*

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MAR 23 1933
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*Edited by*

W. H. PEARSALL, D.Sc., F.L.S., and W. R. GRIST, B.Sc.,
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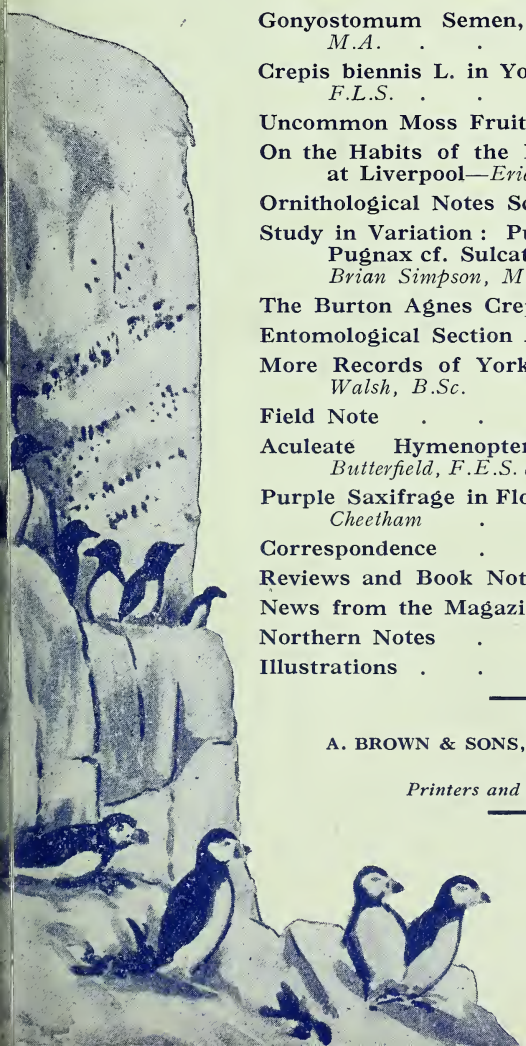

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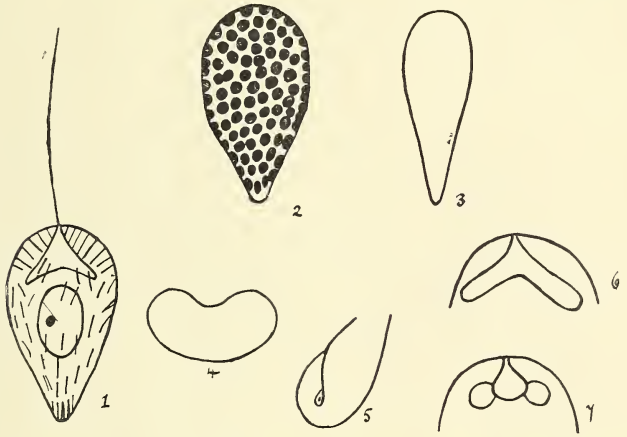
# *GONYOSTOMUM SEMEN* DIESING.

## A Flagellate now first recorded for the British Isles.

A. MALIN SMITH.

On July 6th, 1929, I collected an organism at Austwick Moss, W. Yorks., v.c. 64, which I identify as above. It has been found each year since at the same place and also at Helwith Moss on June 9th, 1930, and May 7th, 1932.

This organism belongs to the Chloromonadales, a group of highly specialised unicellular flagellate forms. Pascher[1] records four genera of the group, one of which is colourless. These comprise six species, three of which belong to *Gonyostomum*. The only species of this group so far recorded




for the British Isles is *Vacuolaria virescens* Cienk, recorded twice in recent years.

*Gonyostomum semen* is a free-swimming cell furnished with two flagella, one of which is directed forward and the other backward along a ventral groove. Two aspects of this groove are seen in Figs. 4 and 5. The cell is of comparatively large size, being 44-67 $\mu$ long and 30-36 $\mu$ wide, in the examples measured by me. It is markedly flattened and the thickness is approximately three-fifths of the width. (*c.f.* Figs. 2 and 3). There is no cell-wall, but the cell is bounded by a firm outer layer or periplast in which highly refractive trichocyst-like rods are embedded. These are regularly arranged at the anterior and posterior ends of the cell, irregularly elsewhere. (See Fig. 1). The rods at the posterior tip of the cell are specially noticeable, as this tip is frequently free from chloroplasts. The free forwardly directed flagellum

[1] 'Süsswasserfl, Deutschlands, Österreichs und der Schweiz.' ii 179, figs. 381 and 382 (1913).

is about the same length as the body of the cell. The trailing backwardly directed flagellum vibrates in the ventral groove and the flickering due to this vibration was clearly seen in cells viewed when turning over. (Fig. 5). The organism normally swims steadily forward, grooved side downwards, without any spiral turning motion, such as is characteristic of Chlamydomonas. Sudden backward movements are frequent.

In the fresh cell the chromatophores are not visible as clearly separated bodies, but treatment with very dilute iodine causes the cell to round off and to discharge its refractive rods, which lengthen somewhat on discharge. During this change the chromatophores are revealed as clearly separate green bodies. In such a rounded cell their shape is round, but when occasionally visible in the fresh living cell, they are more elongated. Fig. 2 shows their distribution in a cell which, though not fully rounded off, yet shows them clearly. Continued action of iodine causes the cell to disintegrate and, as it does so, the chromatophores are discharged from the cell and are seen outside mixed with small oil glubules, oil being an assimilatory product of this organism. In these iodine treated cells the nucleus becomes clearly visible. It is large, and in a dying individual which had rounded off to dimensions of 41 $\mu$ × 35 $\mu$, the nucleus measured 18 $\mu$ × 11 $\mu$. It possesses a small nucleolus. Irritation by iodine apparently causes the dense, taut periplast to slacken and thin out, and this, together with the fact that the rods have been got out of the way by discharge, clearly reveals the chromatophores as separate bodies. Owing to its extreme susceptibility to irritating liquids, the organism cannot easily be preserved, as it disintegrates very quickly in all the media so far tried.

Figs. 6 and 7 show two views of the vacuole system at the anterior end. There is one large three-angled vacuole opening anteriorly to the outside and in another plane rounded diverticula of this can be seen. The central space and the diverticula slowly change their relationships so as to look at one time almost separate, at another time united. The cell is slightly metabolic. When unimpeded, it swims smoothly forward and the normal shape, as then shown, is not curved.

It is found in still pools among *Sphagnum*, and is most common in pools with a good deal of free water with some *Sphagnum*. Pools in which filamentous algæ are abundant do not contain it. Small quantities of *Microspora tumidula* and *Cocystis solitaria*, however, accompany it among the bogmoss. Pascher[2] records it as widespread yet occasional on the continent in stagnant water and peaty pools. No reproductive stages were observed.

[2] *Loc. cit.*

# CREPIS BIENNIS L. IN YORKSHIRE.

E. DRABBLE, D.Sc., F.L.S.

With the question of the presence of *Crepis biennis* in Yorkshire has become involved the identity of certain plants gathered near Bridlington by Messrs. Lawson and Flintoff and others. As one of those whose misfortune it is to have been drawn into the discussion, a short statement from me may, perhaps, be permitted. In 1929 the late Dr. G. C. Druce sent me a sheet labelled ' *Crepis nicæensis* Balb., N. Yorks., June, 1929, ex R. J. Flintoff ' for my determination. The plant clearly was not *nicæensis*, as the hairy inner surface of the phyllaries at once showed, but the specimen was in such extremely poor condition and so incomplete that no determination was possible. A plant, however, was raised from a fruit of this specimen, and this formed a good rosette in 1930 and flowered in 1931, but it was apparently self-sterile, as no fertile fruits could be obtained. This plant was similar to a *Crepis* found by me in that year at Freshwater, Isle of Wight, and was identified as *C. oporinoides* Boissier, Voyage botanique dans le Midi de l'Espagne.

I have seen the specimen from Allerston, which Mr. Flintoff says is now ' at rest ' in the Herbarium at Kew. It would have been well could that rest have remained unbroken, but it has been disturbed by Mr. Flintoff himself in *The Naturalist*, November, 1932, p. 318. The specimen as I saw it was an incomplete plant without ripe fruit, and, in my opinion, was not one on which a determination could firmly be based for purposes of record.

In July of the same year (1932) Mr. Lawson sent me plants with ' Bridlington ' as the only indication of locality. One of these was distinctly hairy, but the rest were apparently large forms of the same plant as that sent me by Dr. Druce and grown by me from seed. There were no ripe fruits, but I was told that if I would only wait patiently they would ripen off. My previous experience with the cultivated plant led me to watch this with interest and it was no surprise to find that this did not happen, thus confirming my impression that the plant was self-sterile.

Later in the same year Mr. Lawson sent what he stated to be fruiting heads of a large *Crepis*, presumably from the same locality. The pappus was well formed, but there was not a single fertile fruit. These specimens had markedly hairy peduncles and involucies, and were probably *biennis*. Thus from North Yorkshire I have seen plants which I regard as (1) *biennis*, (2) *oporinoides*.

Firstly with respect to *biennis*. This is recorded in J. G. Baker's ' Flora of North Yorkshire ' as ' In Cleveland in cultivated fields, Great Ayton, W. Mudd ! ' This, with Baker's confirmatory ' !,' should be a satisfactory record, and my experience with the North Yorkshire plants offers no challenge to

Baker's mark of exclamation. It is probably thoroughly justified, and Mr. Flintoff's ambition to furnish a record 'without the addition of a note of exclamation' is surely a very strange one.

The other plant, *C. oporinoides* Boiss., is, in my opinion, merely a variety of *C. biennis* (see *Journal of Botany*, October, 1932, p. 280), and I shall not be at all surprised should it be found in other parts of the country. That it has until this year (1932) been recorded, so far as I know, only from the Sierra Nevadas in Spain may well be due to lack of extensive and intensive study of *C. biennis* throughout its geographical area in this country and on the Continent. It does not seem to me likely that *oporinoides* has had a separate distribution from *biennis sensu stricto*. It may well be a mutational form which may crop up anywhere, and its occurrence at Freshwater—a *biennis* area—may be significant.

During the coming season plants should be gathered in North Yorkshire by some responsible collector and the same material be circulated to all those who have previously tried to furnish help, and here it should be noted that fruiting heads must be sent if determination is to be secured. The plants ought also to be observed in cultivation, and to this end ripe fruits must be collected on the spot, where pollination from plant to plant may have taken place. That *oporinoides*—though probably self-sterile—does produce fertile fruit in Yorkshire is shown by my success in raising the plant from seed. Meanwhile, may not all of us who have been drawn into this discussion agree to let the matter rest until we have all examined adequate and identical material.

## UNCOMMON MOSS FRUITS.

CHRIS. A. CHEETHAM.

THE present season appears to be a good one for mosses, and some unusual fruiting plants have come under my notice.

The first to attract attention was *Anomodon viticulosus*, which is a very common moss in our limestone districts, but which is seldom seen fruiting; this winter it is very full of fruit in a place on Giggleswick Scar, where it has required careful search to find fruits in recent years. Then, on a roadside bank near Oxenber, *Mnium undulatum* may be seen bearing capsules; this place is where our Bryological committee saw it in 1915, careful search in the intervening time having been unsuccessful. *Trichostomum tortuosum* is not often seen in fruit, but recently a tuft was seen in this condition. Lastly, several fruiting plants of *Hylocomium squarrosum* were seen with capsules, this moss being another very shy fruiting species.

These examples suggest that the present time may well be used to see if further species are showing such signs of abnormal fruiting, preferably in well-known localities to the individual worker.

# ON THE HABITS OF THE RED SQUIRREL AS OBSERVED AT LIVERPOOL.

ERIC HARDY.

For the last ten years I have kept regular observations on a colony of some twelve breeding pairs of the British Red Squirrel (*Sciurus leucorous*) near my home. The area is park-land, deciduous trees in small woods and plantations, with a few conifers in two or three small groups, covering some 270 acres. The squirrels are perfectly wild, afforded no protection in the way of nesting boxes, though two pet pairs were released about ten years ago when the colony was getting less. It has since much increased.

Appearance of Specimens.—The winter-coat is complete by early November, though the grey hairs are prominent by October. The summer coat is assumed in May and complete by June. Occasional specimens show a tendency to lightness in the tail in autumn, but I have never known an albino or a dark melanic form in the local colony, though my uncle, E. T. Turner, has watched a pure albino red squirrel in Gumley Woods, Leicestershire, at the end of the last century, and a black squirrel was shot at Watford in October, 1865.

Breeding Habits.—In no case have I found any definite proof of the use of extra summer dreys, often alluded to in literature on the subject, to which the young are transported when the original drey is in danger. In many pairs in the colony the same drey was used for summer and winter, though seldom two summers in succession, for the squirrels usually shift their quarters each breeding season. The pair mate for life, but do not always breed in the same locality each summer, and never have I found two pairs breeding closer than about fifty yards. There are marked territory rights which are vigorously enforced in the breeding season, though not so much in winter, when considerable intrusion occurs. The young do not stay with their parents long after leaving the drey, being independent by November. Young leave the drey early in June, though they are in the drey in May and often as early as April. Very often the old nest of a magpie (*Pica pica pica*, Linn.), very common in the area, is used for a winter drey, while I have known an old rook or crow nest to be similarly used elsewhere. The pair keep together during the winter and the young may or may not breed the first season after birth. They occasionally rear two broods. Trouble is experienced with stoats elsewhere, but these do not occur here, while rats, which take heavy toll of young birds, do not affect the squirrels.

There is a definite nuptial display, though the full courtship

is rather difficult to make out from casual play, mated pairs often playing with each other outside the breeding season. It appears to be mostly male and female chasing each other, stopping to face each other almost nose touching nose for a few seconds, and then continuing, chaser and chased frequently changing place. They often roll over and over in grips, biting at each other and squealing all the time. From time to time during the courtship, which usually commences soon after the winter coat is donned and continued during the building of the drey and also during play, the male runs up to the top of a thorn tree and sitting bolt upright on its hind legs, scans the surrounding countryside for danger. The courting is usually carried out in very early morning.

Habits.—These Red Squirrels definitely do not 'hibernate' during the winter months, as I have frequently recorded their occurrence abroad at all times of the winter (see 'Squirrels not Retired by December,' *The Naturalist*, March, 1931; my 'Field Notes for 1931,' *Proceedings Liverpool Naturalists Field Club*, 1931; 'Country-Side,' *Nature Records*, Spring and Summer, 1931, Spring, 1932). There is no time of the winter that I have not found them abroad, even when thick hoar frost covers the ground and when the temperature is below freezing, though individuals vary and some will sleep in their dreys through the colder weather. They are abroad before daybreak, and on Christmas morning 1930 I watched one feeding beneath its drey an hour before sunrise in a copse that was then pitch dark. I had already walked by it without seeing it when its movements, as it bolted, disclosed its presence. Though abroad before daylight I have not found them abroad after dusk. I have frequently seen them feeding during heavy rain on spring and summer mornings, but their tails get very wet and heavy and the squirrels are continually washing themselves and shiver much from the cold. They feed chiefly on beechmast here, because hazel does not occur where they breed. They prefer beechmast to acorns.

They are, on the whole, very tame, and individuals learn to recognise particular people with whose presence they become associated. They will take chocolate and eat it with relish, and two or three people make a regular habit of feeding them with nuts, chiefly Brazils, which they take from their hands and often climb on to their knees and shoulders in a similar manner to the grey squirrels in Regent's Park, though not quite so confidingly. They are always far more tame in early morning than at mid-day, and seem to get more wary when more people get about. The female is always shyer than the male.

They frequently drink in summer, despite assertions to the contrary by some writers. They lap the water like a

rabbit, and can swim. They do not bury the charming ' nut-larders ' each autumn as so picturesquely described by many writers of popular nature notes. They bury odd nuts here and there in the fallen leaves with no attempt at distinct hoards. The action is purely automatic instinct and shows no knowledge or design behind it. In winter the squirrel scratches indiscriminately amongst the fallen leaves for nuts, with no particular search for anything buried by itself ; I have no doubt that the squirrel has no knowledge that it buried nuts there in the autumn. Nuts naturally fall off trees into the dead leaves, and the squirrels are sure to find some there by scratching. They scratch because experience teaches them it is the most productive way of finding food. They always peel off the husk with their canines before chewing the kernel, and hold it with their two ' thumbs ' to do so, spinning it round as the husk peels off. The main feeding spell seems shortly after daybreak: it is carried on casually to mid-day or a little after, but ceases in the afternoon. They do not touch fungi, at least to my knowledge, owing to an abundance of other food.

The range of movement in winter is fairly wide and individual territories are considerably invaded. In fact, territory rights seem non-existent outside the breeding season. Occasionally, in autumn or winter, odd squirrels are seen in villages on the south edge of the city, where they do not occur normally. They frequently travel nearly a hundred yards on the ground, especially where the trees are thin or interspersed with meadowland.

Their natural enemies seem few. Stoats and weasels cause trouble elsewhere but do not occur here. I have found no evidence of rats killing them, but in winter, when the area is frequently in possession of flocks of gulls and rooks, I have seen herring gulls and rooks attack individual squirrels, chiefly when the latter are covering distances on the ground, and in all cases the squirrels show extreme fear and make every effort to regain trees. It is quite possible for a herring gull to kill a squirrel. Skin disease has not broken out in recent years, but there seems to be a long cyclic increase and decrease, longer though than Middleton has shown with the voles (*Journal of Ecology*, Vol. XVII, No. 1, and Vol. XIX, No. 1).

Relation to Grey Squirrel.—The alien Carolina Grey Squirrel (*Sciurus carolinensis*) does not occur in the area, but I have kept observations in woods in Leicestershire and Northamptonshire where red and grey species occur, and I cannot hold the view that the grey is responsible for driving out the red. There is often fighting between both species, but in the Brampton Ash Woods, Northamptonshire, and

Old Dalby Woods, North Leicestershire, both species exist together and have done so ever since the grey appeared, the keepers tell me. They do not intermingle, but there is no noticeable enmity, and in the former case the keeper tells me the red squirrels are increasing though he still shoots them. The increase and decrease of the red squirrel thus seems, as Middleton indicated in his paper on the grey squirrel in the *Proceedings of the Zoological Society of London*, 1930, to be one of cycles and not connected with the grey squirrel, for areas where the grey squirrel does not occur, as all the red squirrel haunts around Liverpool show this periodic increase and decrease. Red squirrels were on the decrease in this area eighty years ago after fairly wide distribution (see Byerley's 'Fauna of Liverpool' in *Proceedings of Liverpool Literary and Philosophical Society*, 1853-4,) but within recent years appear to have reached the end of the decrease cycle and are on the increase again.

## ORNITHOLOGICAL NOTES FROM SCARBOROUGH.

W. J. CLARKE.

A LATE House Martin was seen hawking for flies in the shelter of the cliffs at Cloughton Wyke on November 27th, 1932.

On January 23rd, 1933, a melanic variety of the House Sparrow visited my garden to feed with other birds; it remained about until February 3rd. Its plumage above and below was a uniform sooty black which gave no indication of its sex. That it was not coloured by dirt was evident from the gloss to be seen on the feathers in certain lights. The legs also appeared to be black, but the beak was of the normal horn colour.

An Albino Thrush, all white with the exception of a few dark feathers on the rump, has been seen by several observers at Scarborough during early February.

Waxwings appear to have visited Yorkshire in some numbers during recent months. I have notes of the following occurrences in or near the Scarborough district :—

Five at Scarborough on November 26th, 1932.
One at Scalby on November 28th.
Two at Scarborough on December 1st.
Five at Rillington, last week in December, 1932.
"Several" at Scarborough, January 19th, 1933.
One at Scarborough, January 21st.
Five at Cloughton, January 26th.
Four at Scalby, January 26th.

Some of these birds have been seen far within the boundaries of Scarborough, where they visit gardens and feed on the berries of the Cotoneaster. Others have been seen eating the fruit of the Wild Rose.

# A STUDY IN VARIATION: *PUGNAX PUGNUS* Martin, and *PUGNAX cf. SULCATUS* J. de C. Sow.

BRIAN SIMPSON, M.Sc., UNIVERSITY COLLEGE, SWANSEA.

THIS paper describes the results of a graphical and mathematical survey of a group of six hundred specimens of *Pugnax*. These were selected, because of their completeness, from a group of two thousand, collected by Mr. A. E. Alkins from a small area, and at one locality, in the Carboniferous Limestone of Castleton, Derbyshire. The collection is now in the Department of Geology, at the University College of Swansea. A cursory examination of the group shows that considerable variation exists.

The measurements were all made by a vernier calliper,

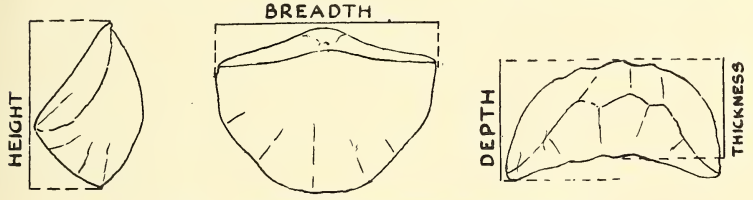



**Fig. 1. Illustrating the terms used in the text.**

reading to the nearest .1 mm., and all the calculations obtained by slide rule.

Four variants have been considered :

*height* : from the umbone to the anterior margin of the shell.
*breadth* : the greatest measurement parallel to the hinge line.
*thickness* : at right angles to these two.
*depth* : the greatest measurement at right angles to the hinge line and at right angles to the height. This measurement was found necessary in order to indicate the height of the ridge and the depth of the furrow.

The percentage ratio of one variant to another has been worked out in four cases, namely :—

$$\frac{height}{breadth} \times 100 \qquad \frac{thickness}{height} \times 100 \qquad \frac{depth}{breadth} \times 100 \qquad \frac{thickness}{breadth} \times 100$$

and from the results obtained, frequency polygons and scatter diagrams have been constructed.

HOMOGENEITY OF THE GROUP.—From a short examination of the group it appeared that possibly two forms were represented. In order to test this, frequency polygons were constructed. In such curves, obvious and marked irregularities have, in many cases, been shown to indicate a discontinuous variation in the group, caused by the presence of one or more species

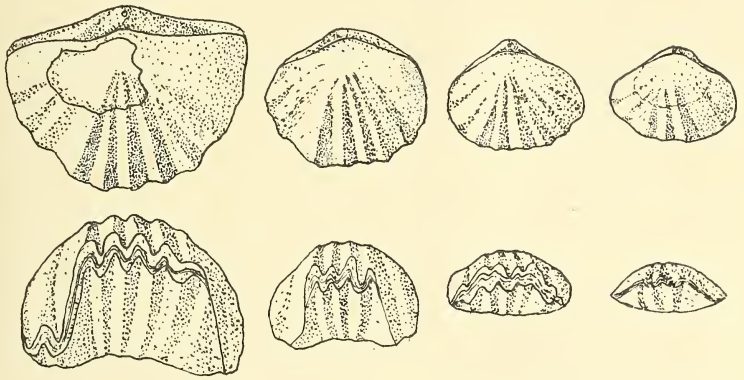
within that group. The scatter diagrams show the correlation or otherwise of two variants, a wide and indiscriminate scatter indicating low correlation, while the location of the scatter in two diagonally opposite quadrants indicates a high degree of correlation. As a further measure of correlation the arithmetic mean deviation has been calculated, and also expressed as a percentage of the mean measurement of the variant, in the same way as indicated by Vernon (1). The straight plotting of *height* and *breadth* as ordinates of a scatter diagram enabled the limiting curves—a maximum and a minimum—to be calculated, thus giving at any point the limits between which any specimen might be expected to vary.

Consideration of the Frequency Polygons.—In all the diagrams the solid lines represent the polygons in which the six hundred specimens are considered. In all cases the boundaries of the polygons are full of minor irregularities due to the lack of numbers ; however, in three of the four diagrams (Fig. 3, B.C.D.) two major peaks are observed, the exception being $\frac{height}{breadth} \times 100$ in which case the polygon gives impression of homogeneity, being a normal binomial curve. Judged on this diagram alone there is nothing to suggest any abnormality in the group, this phenomenon being due to the fact that the variants change in the same way and increase at similar rates.

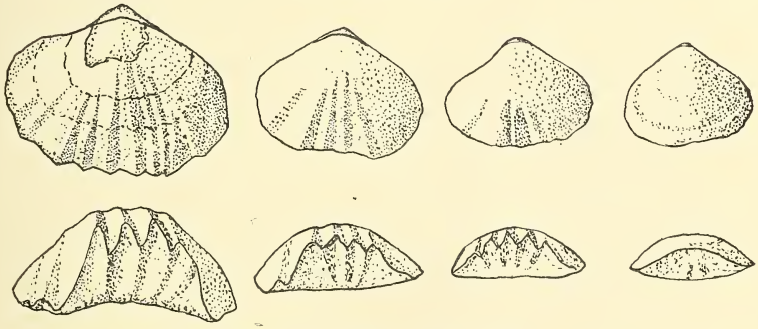
The three polygons with irregularity each show one large peak on the right and a smaller one on the left. When this fact was discovered the specimens falling within the two areas enclosed by the peaks were separated and examined further. Three characters were found to differ, first the anterior margin, second the tumidity, and third the sharpness of the ribs. There were smaller and younger specimens of the two species somewhat intermingled, and in this preliminary sorting it was necessary to fix on one difference between the two. Since the internal characters showed no obvious difference, the character of the anterior margin was taken as the feature of differentation, with the result that 450 specimens fell into the species *Pugnax pugnus* Martin, and 150 into the group which is here named *Pugnax* cf. *sulcatus* J. de Sow. The differences are seen in the drawings Fig. 2 where the anterior margin, the tumidity, and the sharpness of the ribs constitute marked differences in the species.

Variation in *Pugnax pugnus* Martin.—Martin (2) gives the type species and figures it in Plate 22 of his work as *Conchyliolithes anomites subrotundus*. The drawing of the anterior view is not copied by later writers. Davidson (3) omits the layered nature which Martin shews and which is very characteristic. The species is described by Davidson

as follows : ' shell very variable in shape, transversely ovate or oblato—deltoidal ; wider than long ; dorsal valve gibbous, most elevated near the front, evenly convex at the umbone ; mesial fold large, and more or less prominent. Ventral valve less convex than the opposite one, with a sinus of moderate depth, commencing at a short distance from the beak, and



*Pugnax pugnus* **Martin.**



*Pugnax cf. sulcatus* **J. de C. Sow.**

**Fig. 2. A series of four specimens of each species to show the variation. The younger specimens are placed to the right.**

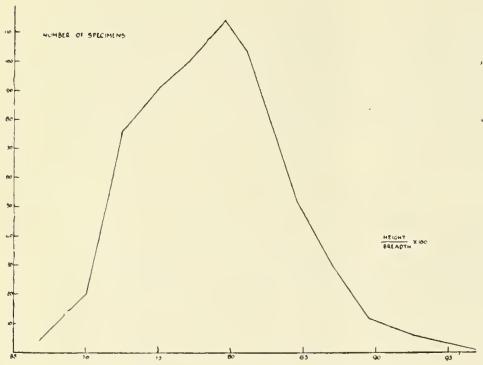
extending to the front. Beak small, much incurved, and but rarely visible in full grown shells. Each valve is ornamented with from nine to fourteen ribs, which become obsolete as they approach the beak and umbone ; from three to six occupy the fold and sinus.'

Three examples measured :

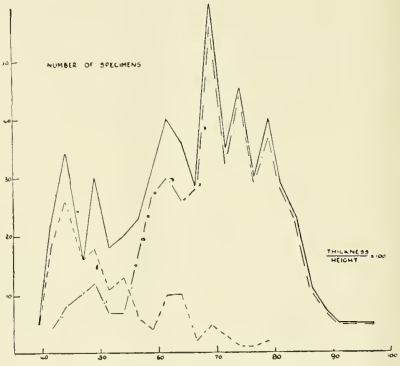
| | | |
|---|---|---|
| Length 12 lines. | Width 17 lines. | Depth 12 lines. |
| ,, 24 ,, | ,, 24 ,, | ,, 20 ,, |
| ,, 11 ,, | ,, 15 ,, | ,, 10½ ,, |

In Fig. 3 are the four graphs shewing the variation in the two species.

After the separation of the two species the graph of the variation of each was superposed on the original graph and appears in each polygon. Fig. 3 A shews only the one graph, since the variation is almost identical in the two species with




A. Shewing relation $\frac{height}{breadth} \times 100$




B. Shewing relation $\frac{thickness}{height} \times 100$

C. Shewing relation $\frac{depth}{breadth} \times 100$

D. Shewing relation $\frac{thickness}{breadth} \times 100$

**Fig. 3.**

respect to these two factors. The two mean values for these species are : *Pugnax pugnus* Martin, 78.88.

*Pugnax* cf. *sulcatus* J. de C. Sow, 79.83 indicating a very slight tendency on the part of *P.* cf. *sulcatus* J. de C. Sow to a quadrate section. Little useful purpose would be served in separating these two in respect of these variants.

Plotting the two variants as ordinates of a scatter diagram Fig. 6 shews that there are limiting curves within

which the specimens vary : these curves have the following formulæ :

Maximum curve. $.0135h^2+1.169h-.044$
Minimum curve $.105h^2+1.283h+.013$

It is seen from these curves that the variation increases in amount as the specimens increase in size : that is, as they approach maturity. Compared with the latitude in other factors, the variation in this instance is small, most of the specimens lying within a range of 20 per cent., about half the

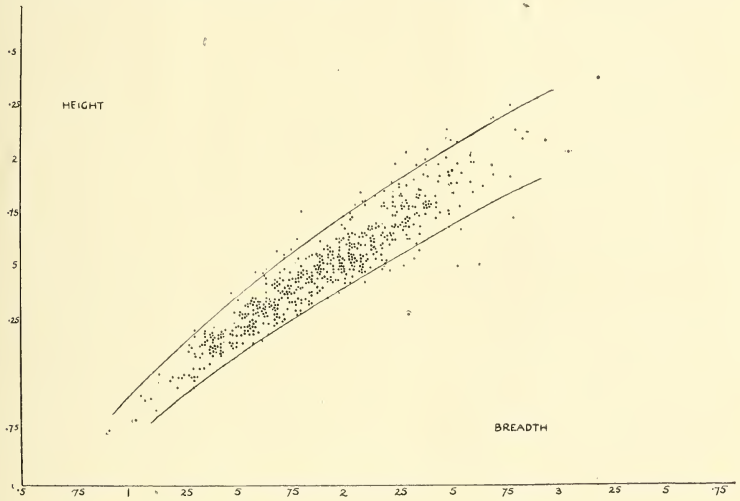



**Fig 6. Illustrating the maximum and minimum curves in the variation of height to breadth.**

range in the other factors. This indicates that the ratio of *height* to *breadth* remains almost constant during growth.

In the diagram representing $\frac{thickness}{height}\times 100$ Fig. 3 B, it is seen that the range is considerable, 53 per cent. The mean of the factor is 70.33, indicating that a similar ratio occurs here as in $\frac{height}{breadth}\times 100$ although the range is considerably more.

The arithmetic mean deviation is 8·76 or 12·31 per cent. of the mean for the species. The largest number of specimens is seen to lie within narrow limits 60 per cent—80 per cent. and represents the mature individuals, while those outside these limits, represent either very young forms when the relation is low, or very large specimens when the relation approaches 100 per cent. and the specimens present a quadrate appearance.

(*To be continued.*)

# THE BURTON AGNES CREPIS

R. J. FLINTOFF.

In 1923, Mr. Major Lawson, of Bridlington, found a plant on waste ground in or near the cemetery at Burton Agnes, near Driffield. He showed specimens to me on several occasions. At first, I identified it as *Crepis biennis* Linn, later, I thought it resembled a large form of *Crepis capillaris* Wallr., and finally, I favoured again *Crepis biennis*. In 1925, specimens were sent to Kew where they were named *Crepis biennis* Linn.

For July, 1925, I find this entry in my ' Field Book ' :—' As there appears to be still some doubt regarding the identity of the Burton Agnes *Crepis*, I have sent a specimen to Dr. Druce.' Dr. Druce was always very kind to me, and for nearly twenty years I have been in constant friendly communication with him. At all times he gave to me most valuable help very willingly.

Early in July, 1928, I sent a specimen to Dr. Druce, and on the 10th, I received a reply from him in which he called it *Crepis taxraxacifolia* Thuill. On September 10th, 1928, Dr. Druce wrote : ' It is *Crepis nicæensis*, in which I am quite interested. It differs from *C. capillaris* Wallr., and from *C. biennis* Linn in its being a rougher plant with often many satæ on the peduncles. The receptacle is quite different, being fovillate—each hole where the achene springs from has a winged border.'

On the 14th September, Mr. Lawson sent me the following notes :

' 17th June, 1923. In Burton Agnes cemetery I found a composite plant growing in abundance.

23rd June, 1923. Flintoff considers that this plant is a large form of *Crepis capillaris* Wallr.

18th June, 1924. The giant form of *Crepis capillaris* again observed by J. R. Bramley and me.

23rd June, 1925. The giant variety of *Crepis capillaris* from Burton Agnes turns out to be *Crepis biennis* Linn, identified at Kew.'

In early June, 1932, I had been gleaning information relative to the identity of the *Crepis* growing at Allerston, near Pickering, and on the suggestion of Mr. Francis Druce and Mr. A. J. Wilmott, I sent a specimen to Dr. Drabble, who requested me to send him the Burton Agnes *Crepis*. He thought the plant was most probably *Crepis oporinoides* Boiss.

In *The Journal of Botany* for July, 1932, there is the following note by Dr. Drabble :—' *Crepis oporinoides* Boissier *in Britain*. In October, 1931, a large *Crepis*, which differed in several striking respects from *C. biennis* Linn, was found at Freshwater, Isle of Wight. In 1929, Dr. G. C. Druce sent to me a specimen labelled (in his own hand) *Crepis nicaeensis* Balb, N. Yorkshire, June, 1929, ex R. J. Flintoff. Druce was evidently dissatisfied with this name, and desired my opinion. The specimen was very imperfect, but a few ripe seeds were present, and from one of these a good plant was raised which flowered in 1931, and agreed in essentials with the Freshwater plant. I have identified these plants as *C. oporinoides* Boiss., and a full account will appear in a paper on the genus *Crepis* in Britain shortly to be published in this journal.'

The paper duly appeared in *The Journal of Botany* for October, 1932, and in this the above statement is repeated in similar but slightly altered words. Those who are interested should read Dr. Drabble's article in its entirety, so I will only make one quotation, relative to the Burton Agnes plant from the section headed ' *Crepis oporinoides* Boiss.' : ' Certain specimens recently received from Mr. Major Lawson, of Bridlington, though not in fruit, appear to belong to this species. They show extremely vigorous growth, attaining a height of three feet or more, with stems up to three-quarter inch in diameter at the base. The divisions of the

leaves are broader than those given in the above description, but the general proportions are roughly maintained. No evidence is yet available as to the mode of introduction of this plant into Great Britain. At Freshwater, it grew in a meadow ; in North Yorkshire, on waste ground. Attempts to induce seed formation by pollinating the flowers on the cultivated plant proved completely unsuccessful, and the failure may indicate self-sterility. The original N. Yorkshire plant sent to the writer by Dr. Druce, which grew, it is understood, with many more of the same kind, had formed fertile fruit.'

When Dr. Drabble writes of North Yorkshire, he means, of course, East Yorkshire. This is an important correction, because it might lead to confusion between the *Crepis* from Burton Agnes and the *Crepis* from Allerston.

Further specimens were sent to Dr. Drabble which are dealt with in the following letter from Mr. Lawson, dated 11th October, 1932 : ' I was at Burton Agnes last Friday, and I obtained a solitary specimen of *Crepis* in fruit. It was a secondary growth, but not a very fine one, as it had grown from a primary stump which had been cut by the scythe a few months ago. I sent this to Dr. Drabble as he desired to have a further specimen, and I enclose his reply, dated 9th October, 1932 : " Thank you for the plant from Burton Agnes. Though peculiar in some respects, I can only call it *Crepis biennis*. I don't think it is the same as the large and much less hairy plants you kindly sent to me in June ; if I can ripen off fruits, I shall try to grow it." '

Mr. Lawson continues : ' I am sorry Dr. Drabble does not think it is the same species as the one I sent to him in June. I feel almost certain these autumnal secondary flowers and fruits are identical with the early tall plants of June. In fact, it is quite easy to recognise the old summer stumps. Last time Dr. Drabble called the plant *Crepis oporinoides* Boiss. and this time he suggests *Crepis biennis* Linn., which, I think, agrees with your decision more than once expressed.'

I will now summarise the results of this investigation made over a period of nearly ten years. The following are the suggested names :

| | | | |
|---|---|---|---|
| 18th June, 1923. | *Crepis biennis* Linn. | } | Flintoff. |
| 23rd ,, 1923. | *Crepis capillaris* Wallr. | } | |
| 25th June, 1925. | *Crepis biennis* Linn. | | Kew. |
| 10th July, 1928. | *Crepis taraxacifolia* Thuill. | } | Druce. |
| 10th Sept. 1928. | *Crepis nicaeensis* Balb. | } | |
| 18th June, 1932. | *Crepis oporinoides* Boiss. | } | Drabble. |
| 9th Oct. 1932. | *Crepis biennis* Linn. | } | |

From a consideration of these data, I conclude that *Crepis biennis* Linn is a very variable plant, particularly in regard to its hairiness, so that different specimens show marked dissimilarities, leading to their confusion one with another, and with other closely allied species. It may be there are several very rare species of *Crepis* growing at Burton Agnes in the same small plot of land. As Mr. Lawson has pointed out, this seems extremely improbable. Further, I am of opinion that the *Crepis* at Burton Agnes in the East Riding, and the *Crepis* at Allerston in the North Riding, are both *Crepis biennis* Linn., and most likely new records for both Ridings. The late J. F. Robinson, in his ' Flora of the East Riding,' gives : ' *Crepis biennis* Linn. Colonist. Ger. 1. On the wolds, near Bishop Burton (Robert Teesdale) : not noted by anyone since, and probably a mistake at first. (See *Wats. Top. Bot.*).'

And for the North Riding, John Gilbert Baker gives one doubtful station at Great Ayton, recorded by W. Mudd.

In any case, they are very rare plants. Will any botanist, who is in a position to give authoritative information, relative to the occurrence of *Crepis biennis* Linn. in the East or North Ridings, be kind enough to do so ?

*1933 March 1*

## ENTOMOLOGICAL SECTION ANNUAL MEETING.

Members of the Entomological and Plant Galls Sections of the Y.N.U., met at the Leeds Museum, on Saturday, October 15th. Mr. J. M. Brown, B.Sc., F.L.S., presided. Tokens of respect were paid to the late Mr. B. Morley and Mr. Beanland, former active members of the Section.

The afternoon meeting was devoted to a most interesting and varied exhibition of specimens.

Mr. Bayford shewed the scarce *Blethisa multipunctata* from a new station near Barnsley, and members discussed its distribution in the county. For Mr. Wood, of Keighley, Mr. Bayford exhibited a beautifully set series of county Coleoptera containing some rare and interesting insects. Material in other orders collected by Mr. Wood was shown, all characterised by the same meticulous care in mounting. Mr. Wood has liberally distributed this material for determination, and it is hoped that the results will appear in these pages.

Mr. Cheetham exhibited an interesting series of Diptera from the Austwick district, and discussed the restricted season of several of the species. *Dicranomyia aperta* Mr. Cheetham has found associated with grass of Parnassus and only to be found during the very limited flowering period of that plant. Besides *Orimarga alpina*, *Tipula caerulescens*, *Spania nigra*, and *Ptiolina nigra*, Mr. Cheetham showed the three closely allied Daddy-long-legs, *Tipula paludosa*, *oleracea* and *czizeki* and the male and female of the common *T. fulvipennis*, together with a male showing female wing and leg characters on one side.

Mr. Thompson showed interesting Coleoptera and Hemiptera. *Agabus femoralis* Pk. from Upper Teesdale ; *Mycetoporus splendidus* Grav., Redcar ; *Arpedium brachypterum* Grav., Ingleby-in-Cleveland ; *Lesteva luctuosa* Fauv., Northumberland ; *Rhizophagus parallelocollis* Gyll., and *R. cribratus* Gyll., Co. Durham ; *Priobium eichoffi* Ld., Kildale-in-Cleveland ; *Barypethes araneiformis* Shr., and *Hydronomus alismatis* Marsh., from Co. Durham.

The *Hemiptera* comprised *Corixa semistriata* Fieb., Co. Durham, *C. carinata* Sahlb., Upper Wensleydale, *Deltocephalus sabulicola* Curt. from Redcar and *Aphalara exilis* Web., and Mohr., Northumberland. On behalf of Miss Pilkington, Mr. Brown showed galls and sawflies of *Pontania salicis*.

Mr. W. P. Winter gave an account of spider habits and exhibited the larva of a Carabid beetle (? *Pterostichus*) obtained whilst searching for ' leather-jackets.'

Mr. A. E. Winter passed round a series of delightful photographs and photo-micrographs of insect subjects, which were much praised by members.

Mr. J. R. Dibb exhibited a series of Yorkshire mayflies and nymphs preserved in spirit, and showed some recent entomological literature, including Dr. Joy's ' Practical Handbook of the British Beetles.' A series of European Carabids of the sub-family *Chlaeninae* and some striking beetles from Wicken Fen were also shown by Mr. Dibb.

Some little-known neotropical *Odonata* were exhibited by Mr. Hincks, together with some of the modern literature on the species of this region. Mr. Hincks also passed round some interesting Yorkshire and other *Diptera*, including several uncommon local species captured during 1932, and a possible new British species of the mayfly genus *Rhithrogena*.

The President, Mr. J. M. Brown, had a fine series of species of *Psocoptera*, many of them Yorkshire forms. Amongst specimens of *Hemiptera*, Mr. Brown exhibited eight species of *Idiocerus* and two recently-discovered Yorkshire *Plecoptera*, *Amphinemura Standfussi* and *Leuctra moselyi*.

The evening meeting was devoted to the reading of reports and to the nomination of officers.

# MORE RECORDS OF YORKSHIRE COLEOPTERA.

GEO. B. WALSH, B.Sc.
(*Scarborough*).

Our knowledge of the Coleoptera has advanced so much of recent years that it becomes necessary drastically to revise many of the Yorkshire records. In many cases, especially where it has been shown that a reputed species consists in reality of two species or of a congerie of species, it will certainly be wisest to scrap all existing records and start anew ; as examples we may quote the species associated with *Haliplus ruficollis*, *Nebria brevicollis*, *Atheta melanocera*, the genus *Gabrius*, and the like. It probably sounds severe, but, in the same way, all old records of unusual species should be held suspect until such time as they have been confirmed by recent workers ; in many cases this will undoubtedly be done, as, for example, with many of Bissill's old records ; on the other hand, other records—for example, some of Lawson's Scarborough records of wood-feeding beetles, which were almost certainly based on specimens introduced with foreign timber—will inevitably finally be deleted. It would seem wise, also, to put on permanent record the occurrence of common insects in localities rarely visited, so that in the finish we may have a more or less complete knowledge of our fauna available for ecological or zoogeographical study. Finally, all specimens of which there is the least doubt should be submitted to some authority on that particular group for confirmation or otherwise.

It is in the spirit of these remarks that the following notes are made. All specimens of importance have been confirmed by Dr. Malcolm Cameron or Mr. J. H. Keys, according to the group, and Dr. W. J. Fordham has assisted with the Yorkshire distribution. The order and nomenclature are in accordance with Beare's List of 1930. The past two years, 1931 and 1932, have been particularly inimical to insect life. Though the rainfall for the years is probably not far removed from the normal, yet most of it has fallen in the summer months, and heavy floods in May, June and September, have occurred just at the time when they are likely to do the most harm. Large quantities of flood refuse were collected at Yedingham on two occasions, as the following records show, but general collecting has proved of little avail. Nevertheless, a few unusual insects have turned up and these are recorded below.

*Nebria brevicollis* Fabr. (s. str.) Under stones at Hunmanby, and on the cliffs at Bridlington.
*N. iberica* Oliv. Under fallen trees in Beedale.

*Clivina collaris* Grav. Common in flood refuse from Yedingham.
*Amara eurynota* Panz. (*acuminata* Payk.) Two from Yedingham.
*Bembidion gilvipes* Sturm. Yedingham.
*B. atrocoeruleum* Steph. (s. str.) Common on the banks of the Swale at Richmond.
*B. redtenbacheri* Karl D. This species, which closely resembles the preceding one, was added to the British list in 1926 on specimens taken near Sheffield by Dr. Joy, and is recorded in Joy's book as 'very rare.' This is certainly not the case in this area. I have taken it commonly on the banks of Scalby Beck, in crevices in the clay cliffs south of Bridlington, and in small numbers at Buttercrambe. Since Joy's examples were taken on high ground and mine at sea-level, there is no reason to suppose that it is restricted to any particular altitude. (Confirmed by Mr. C. McK. Jarvis).
*Anacaena limbata* Fabr. Yedingham.
*Chaetarthria seminulum* Herbst. Common in flood refuse at Yedingham.
*Empleurus* (*Helophorus*) *nubilus* Fabr. Common at Yedingham.
*Ochthebius* (*Henicocerus*) *exsculptus* Germ. Yedingham.
*Hydraena pygmaea* Wat. Ellerburn, near Thornton Dale; this is rare in Yorkshire.
*Cercyon lateralis* Marsh. Common at Yedingham.
*C. pygmaeus* Ill. A few at the same place.
*Aleochara sparsa* Heer. and *A. bipustulata* Linn. Yedingham.
*Exaleochara* (*Tinotus*) *morion* Grav. (New to the Scarborough list). In flood refuse at the mouth of Scalby Beck.
*Atheta curtipennis* Thoms. (*Oxypoda exigua* Er.) (New to Yorkshire). A single specimen at Yedingham.
*A. gregaria* Er. (Not recorded from the Scarborough area). Abundant at Yedingham.
*A.* (*Aloconota*) *currax* Kr. (new to V.C. 64). In rubbish by the stream at Gaping Ghyll.
*A.* (*Aloconota*) *sulcifrons* Steph. Moss in Forge Valley. Rare in Yorks.
*A.* (*Metaxya*) *gyllenhali* Thoms. (New to Scarborough). Yedingham.
*A.* (*Metaxya*) *elongatula* Grav. (New to Scarborough). In cut grass at Scarborough, and by the side of the stream at Hayburn Wyke.
*A.* (*Hygroecia*) *britteni* Joy. Yedingham.
*A.* (*Dralica*) *rigua* Williams (new to V.C. 62). One example from Yedingham. It has previously been recorded only from Bubwith and Allerthorpe.
*A.* (*Oreostiba*) *tibialis* Heer. (new to V.C. 64). In flood refuse at Gaping Ghyll.
*A.* (*Microdota*) *mortuorum* Thoms. Abundant in fungi at Langdale End.
*A.* (*Atheta s. str. Gg.*) *gagatina* Boudi. (New to Yorks.) In fungi at Langdale End.
*Atheta sodalis* Er. Common in Raincliffe Woods in November.
*Atheta triangulum* Kr. (new to V.C. 62). Two specimens in cut grass at Scarborough, and one example at Yedingham.
*A. crassicornis* Fabr. (New to Scarborough). Common in fungi in Raincliffe Woods, and at Langdale End.
*A. trinotata* Kr. By sweeping near Scarborough Mere.
*A.* (*Hypatheta*) *pertyi* Heer. In fungi at Langdale End in August.
*A.* (*Liogluta*) *longiuscula* Kr. (*vicina* Steph.) (New to Scarborough). Common in cut grass at Scarborough and in flood refuse at Yedingham.
*A.* (*Liogluta*) *oblonga* Er. In carrion in Raincliffe in November. This is a rare species generally in the country.
*A.* (*Megista*) *graminicola* Gyll. (New to Scarborough). Yedingham.
*A.* (*Dimetrota*) *parvula* Mann. (*cauta* Er.) On the sandhills south of Bridlington.
*A.* (*Datomicra*) *arenicola* Thoms. In fungi at Langdale End.
*Meotica exilis* Er. Yedingham.

*Amischa cavifrons* Sharp. Yedingham.
*Tachyusa leucopus* Mann. Yedingham. Common.
*Autalia rivularis* Grav. Yedingham.
*Tachyporus pusillus* Grav. Yedingham.
*Tachinus collaris* Grav. Yedingham. This species seems to be fairly widely distributed in the Scarborough district.
*Mycetoporus longulus* Mann. This species is local in Yorks., but was common in Yedingham flood refuse.
*M. splendidus* Grav. The V.C.H. records this as rare, and only two examples occurred at Yedingham.
*Staphylinus aeneocephalus* De Geer. This species has recently been separated as distinct from *S. cupreus* Rossi. All my Yorkshire examples standing under *cupreus* are really the former species ; they come from Flixton, near Filey, Middleton-in-Teesdale, Langdale End and Scarborough. *S. cupreus* seems to be of southern distribution.
*Philonthus mannerheimi* Fair. (*lucens* Er.) This is very rare in Britain ; one specimen has been recorded from Strensall, near York. Two examples were taken at Yedingham.
*P. cephalotes* Grav. One specimen on Seamer Moor in June in carrion.
*Gabrius* (*Philonthus*) *astutus* Er. (New to Yorkshire). This seems to be even rarer than *mannerheimi* ; Fowler records two localities, one doubtful, and the species has been taken at Plymouth by Mr. Keys. I have taken one specimen on the cliffs at Bridlington in July.
*G. nigritulus* Grav. Our knowledge of the distribution of this insect has improved since Fowler's time ; he recorded it as ' not common,' although we now know it is the commonest member of the subgenus. It occurred commonly in flood refuse from Yedingham, confirming R. Lawson's record from Scarborough.
*G. pennatus* Sharp. (New to Scarborough). Common in Derwent flood refuse from Ayton to Yedingham. This is the second record for the vice-county, Mr. M. L. Thompson having taken it in Cleveland.
*Lathrobium longulum* Grav. This is rare in the North Riding, and is new to the Scarborough district. Three specimens from Yedingham.
*L. terminatum* Grav. One from Yedingham, confirming Lawson's old record.
*Medon propinquus* Bris. (New to Yorks.) One specimen from Yedingham.
*M. obsoletus* Nord. This is rare in the North. One was found in cut grass at Scarborough in July, confirming Lawson's old record.
*Aploderus coelatus* Grav. Common at Yedingham.
*Trogophloeus elongatulus* Er. One from the same place.
*Acrolochus sulculus* Steph. Uncommon at Yedingham.
*Ptomaphagus subvillosus* Goeze.—type and var. *sericatus Chaud.* Both in small numbers at Yedingham.
*Stenichnus collaris* Mann. Abundant at Yedingham. Previously recorded from Raincliffe Woods by Mr. E. C. Horrell.
*Tychus niger ab. dichrous* Goeb. (New to Yorks.) One specimen from Yedingham in September.
*Adalia bipunctata* Linn. ab. *semirubra* Weise, *A.* 10-*punctata* Linn. ab. *superpunctata* Gradl. ab. 10-*pustulata* Linn. and ab. *sexpunctata* Linn. All from Allerthorpe Common.
*A.* 10-*punctata* Linn. ab. 9-*punctata* Linn. Raincliffe Woods.
*Scymnus suturalis* Thunb. ab. *limbatus* Steph. Allerthorpe Common.
*Micropeplus porcatus* Fabr. Yedingham. New to the Scarborough district, but recorded from Saltburn by Mr. Thompson.
*Antherophagus nigricornis* Fabr. (Not recorded from Scarborough). On flowers at Hayburn Wyke.
*Tetropium gabrieli* Weise. (New to Yorks.) Half-a-dozen more or less teneral but well-developed specimens were found, as usual, under the bark of felled larch at Hackness in early July. Mr. Thompson

tells me that he has taken one specimen in a room in his house at Middlesbrough, but this in all probability was introduced in imported timber. Joy gives Leicester as its most northerly locality. It is one of those species which are gradually spreading owing to the afforestation of the country with coniferous trees.

*Dasytes aerosus* Kies. This is not recorded from the Scarborough district, but odd specimens have occurred on Seamer Moor, in Raincliffe Woods, and at Hayburn Wyke.

*Strangalia maculata* Poda. Langdale.

*Saperda scalaris* Linn. This is a very rare Yorkshire species, only one specimen having been recorded—from Crosscliff, in the moorlands above Langdale End. In 1931 a boy brought me a very fine specimen from Seamer, near Scarborough. This is certainly a local insect, but it may have been brought to Seamer in felled timber from Hackness.

*Longitarsus senecionis* Bris. By sweeping in Forge Valley.

*Hydrothassa aucta* Fabr. In numbers in damp places at Scarborough, and common in flood refuse at Yedingham.

*Derocrepis rufipes* Linn. Common by sweeping vetches at Seamer.

*Scaphidema metallicum* Fabr. A few in Yedingham flood refuse.

*Rhinomacer attelaboides* Fabr. This, like *Tetropium*, is gradually spreading over the country. It occurs on the male flowers of the pine in late May and early June at Staintondale and Wrench Green, in both cases in small numbers.

*Rhynchites nanus* Payk. Raincliffe Woods.

*R. tomentosus* Gyll. (New to the Scarborough district). By beating in Raincliffe Woods in June.

*Apion simile* Kirby. (New to the Scarborough district). By beating birch at Filey.

*A. pubescens* Kirby. (New to V.C. 65). Cotherston.

*Sciaphilus asperatus* Bons. Common at Yedingham.

*Phyllobius viridicollis* Fabr. and *Cneorrhinus* (*Atactogenus*) *exaratus* Mann. Both by sweeping at Seamer.

*Phytonomus plantaginis* DeG. (New to our district). Common at Yedingham.

## FIELD NOTE.

**Psylla betulae Linn. in Cumberland.**—Among a number of *Psyllidæ* taken on Todhills Moss, about five miles north of Carlisle, on the 26th of August last, was a single specimen of this uncommon species. In Dumfriesshire I have taken it in small numbers for several years. It occurs with us on birch and is restricted to three or four adjoining trees out of many, and my dates range from mid-August until mid-October. In size and appearance it resembles *P. försteri* Flor., and on this account may be overlooked, but this latter is an Alder frequenting species. The only other northern record I can find is ' Lancashire, rare ' ; in the Lancashire and Cheshire Fauna Check List. My determination was kindly confirmed by Mr. H. Britten.—Jas. Murray, Gretna.

The President of the Republic of Ecuador has conferred the decoration " For Merit " in the order of Official on Doctor George Sheppard, F.G.S., and he has received a Diploma signed by the President, and stamped with the Government Seal.

# ACULEATE HYMENOPTERA IN YORKSHIRE.
## Corrections and Additions.

ROSSE BUTTERFIELD, F.E.S., AND W. J. FORDHAM, M.R.C.S.

SINCE the manuscript of this list was completed, there have been no additions to the county list but there are a few additional localities to record and a few corrections.

1. *Elampus auratus* L. (*Nat.*, 1930, 363), 64 M.W. Roundhay, 28/6/25, with a *Pemphredon* (? *lethifer* Shuck) A.E.B.
2. *Chrysis ruddii* Shuck (*Nat.*, 1930, 364), 64 M.W. Bardsley, 7/6/12, on a sandy bank with *Halictus rubi-cundus* Chr. A.E.B.
   (Mr. Bradley has not taken *Chrysis ignita* L. near Leeds.)
3. *Ancistrocerus antilope* Panz. (*Nat.*, 1930, 366), 64 M.W. Shadwell, 18/5/12, a ♀ on a sunny bank at pondside. J. C. Hesselgrave.
4. *Priscnemis pusillus* Schiödte (*Nat.*, 1930, 368), 64 M.W. Roundhay, 6/8/19, ♀♀ dragging a small, elongated, flesh-coloured spider. A.E.B.
5. *Priscnemis schiödtei* Haupt.; recently separated from *pusillus*, occurs in Notts. and should occur in Yorkshire.
6. *Priscnemis gracilis* Haupt. also separated from *pusillus*, may possibly occur on the Yorks. coast.
7. *Psammochares approximatus* Sm. The record under *nigerrimus* Scop. from Collingham, 1919 (A.E.B.), refers to this species.
8. *Psammochares pectinipes* Anct. Brit. (*Nat.*, 1930, 369), now called *campestris* on the Continent, is inquiline on other *Psammocharidae* like other members of its group.
9. *Astatus stigma* Panz. (*Nat.*, 1930, 369), 61 S.E. Allerthorpe, 31/7/28, 31/7/31, 2 ♂♂, W.J.F. (see *Nat.*, 1931, 174).
   Its parasite *Hedychridium integrum* Dhlb., has not yet been taken in Yorks.
10. *Nysson spinosus* F. (*Nat.*, 1931, 156), stated in error to be parasitic on *Gorytes* and *Arpactus*. This is a definite parasite of *Gorytes mystaceus* but does not attack the closely allied *campestris* which has *N. interruptus*. *Arpactus* is too small to be parasitised by *spinosus* and has its own parasite *N. dimidiatus*.
11. *Metacrabro lituratus* Pz. (*Nat.*, 1931, 156). During the last thirty years has become very general in the southern counties, often as in Devon, extremely common locally.
12. *Crossocerus anxius* Wesm. (*Nat.*, 1931, 157). Breeding in bramble stems is unusual (Halifax, O.G.S., 1908). It occurs numerously in a number of counties, always burrowing in the ground, mostly in vertical cuttings, generally of clay soils, but sometimes in more sandy soil. Colonies are frequent in hedge banks.
    61 S.E. Allerthorpe, 27/7/29, ♂, W.J.F.
13. *Crossocerus elongatulus* V.dw. (*Nat.*, 1931, 158). Smith's records for small *Crabros* are doubtful. Dr. Perkins says that he had many *elongatulus* from York with black hind-legs and no yellow at base of tibiæ. (Litt. 29/11/31).
14. *Colletes glutinans* Env. (*Nat.*, 1932, 235). The parasitic Diptera *Hammomyia grisea* Fln. and *Milto-qramma punctatum* Ing. have been bred from this bee, the former from Allerthorpe (*Nat.*, 1930, 330), the latter from Skipwith (*Nat.*, 1932, 260).
15. *Sphecodes dimidiatus* v Hag. (*Nat.*, 1932, 236), is quite a scarce insect. Yorkshire appears to be its northerly limit.
16. *Halictus smeathmanellus* Kirb. (*Nat.*, 1932, 257). According to Dr. Perkins, Yorkshire specimens of this species are not typical —as also are all specimens from north of a line drawn from the

S.W. extremity of Ireland (Cape Clear) through the S.E. point of the Irish Coast, continued through N. Wales and England. This new species differs from *smeathmanellus* in numerous particulars, including the entirely black clypeus in the ♂, with no yellow spot at the apex and the much less rugose dorsal area of the propodeum in the ♀.

The true *smeathmanellus* has, however, since occurred at York, 2/8/29, a strong colony. W.J.F. (det. R.C.L.P.).

17. *Nomada lineola* Panz. (*Nat.*, 1932, 282), 63 S.W. *Farnhill*, 1910, and *Howden*, 1918, R.B.
18. *Coelioxys mandibularis* Nyl. (*Nat.*, 1932, 311). See E.M.M., 1917, 160. The true *mandibularis* was not known to Smith.
19. *Psithyrus sylvestris* Lep. (*Nat.*, 1932, 329). 'A Revision of the European Bees allied to *Psithyrus quadricolor*, Lepeleter,' by O. W. Richards, M.A. (Trans. Ent. Soc., Lond., 1928, 345-364), was unfortunately omitted from the Bibliography. In it are described several varieties of *P. sylvestris* taken at Roundhay by Mr. A. E. Bradley, *albicans* Rich., *Atricans* Rich., *atrithorax* Rich., *fuscocitrinus* Rich. and *bradleyi* Rich. The type and variety *citrinus* Schundk are quite common at Roundhay.

## PURPLE SAXIFRAGE IN FLOWER IN FEBRUARY.

CHRIS. A. CHEETHAM.

THIS year has not opened with weather such as we enjoyed in the early weeks of last year, and many of the early flowers then noted have scarcely yet made an appearance, but on a visit to the Yoredale limestone buttresses of Penyghent on February 15th a large mass of the Purple Saxifrage (*S. oppositifolia*) was seen in full bloom. This is quite a fortnight earlier than the date the first flowers were seen last year, and it is by far the earliest I have seen flowers on this plant.

## CORRESPONDENCE.

SIR.—I thank 'C.D.S.' for his comments on my note on botanical nomenclature. 'C.D.S.' writes: 'This question is always cropping up and seems to show that the writers do not know their subject, and are unfamiliar with the Codes.' And later: 'The question of name is one of priority and should follow definite rules laid down in the Codes.'

What we ill-informed and very humble workers among the wild flowers want, is to be in a position to consult half a dozen text books in reference to a plant without finding it called by half a dozen different names and expressed in half a dozen different forms.

The chemists, no doubt, would be able to tell the botanists in authority how to bring about this 'consummation most devoutly to be wished.' In the twentieth century the chemists no longer talk or write about azote and phlogiston.

I repeat the closing sentence of my note: 'Surely some effort might be made towards uniformity by the general adoption of a common spelling and form in writing, even if it be found impossible to give one plant one name.' But is it impossible to give one plant one name?

Let us have uniformity, and priority also, if 'C.D.S.' so desires. but in the name of all that is sacred, let us have uniformity for all our sakes, and thereby avoid further additions to the rapidly increasing mass of insanity.—R. J. FLINTOFF.

SIR.—I am making an investigation into the extent to which butterflies in the perfect or imaginal state are preyed upon in the British Isles by

birds, and should be grateful for any first-hand observations, giving, where possible, the species of both butterfly and bird, the date and locality, whether taken at rest or on the wing, how gripped (by wings or body), whether killed by being rubbed against an object, whether consumed by adult or young, whether the wings were swallowed, whether unsuccessful attempts at catching were noticed, and other details of interest. Wings detached by the bird are of value, both as evidence of identity, and also by reason of the imprint of the bird's beak which is sometimes shown.

Published records up to and including the year 1908 have been summarised in the admirable paper by Sir Guy Marshall, C.M.G., F.R.S., "Birds as a Factor in the Production of Mimetic Resemblances among Butterflies" (*Trans. Ent. Soc. Lond.*, 1909, pp. 329-383). I am making a search in both entomological and ornithological literature for British records published since this date, but as such are frequently not indexed and are easily missed, I should also be most grateful for any references which may be known to your readers, especially in the less well-known publications.

Communications can be sent to me c/o the Entomological Department, British Museum (Natural History), South Kensington, London, S.W.7.

C. L. Collenette.

Dear Sirs,

Some years ago, finding that records of the weights of birds in the flesh were scattered over a number of periodicals and ornithological works, I began to collect them systematically as they are often extremely useful. At the present time I have over 3,000 of such records from many sources, British and foreign, but there are still a good many gaps which I should be glad to fill up, and possibly some of your readers may be able to help.

Weights should, if possible, be given in grammes, but if avoirdupois or apothecaries' weight is used, the corresponding weight in grammes can easily be added. Of the following British birds I have no weight records :—

Thin-billed Nutcracker.
Chough.
Shetland Starling.
British Goldfinch.
Siskin.
Twite.
Mealy Redpoll.
Lesser Redpoll.
British Bullfinch.
Scottish Crossbill.
Cirl Bunting.
Red-throated Pipit.
Grey Wagtail.
British Tree Creeper.
,, Nuthatch.
,, Great Tit.
,, Blue Tit.
Irish Coal Tit.
Scottish Crested Tit.
British Marsh Tit.
,, Willow Tit.
,, Long-tailed Tit.
Grasshopper Warbler.
Marsh Warbler.
Dartford Warbler.
Hebridean Song Thrush.
British Stonechat.
,, Robin.
St. Kilda Wren.
Hebridean Wren.
Irish Dipper.
Sand Martin.
Sabines Gull.
British Lesser Black-back Gull.
Great Skua.
Buffins Skua.

I need hardly say that there are many other species of which material is very scanty and *all* weights are likely to be useful if accurately taken and preferably from sexed birds.

If the bird has been dead for some days or is in very poor condition, the fact should be stated.

Hoping that some of the gaps in the list may be filled up by your readers.—F. C. R. Jourdain, Whitekirk, Southbourne, Bournemouth.

## REVIEWS AND BOOK NOTICES.

**The Archæology of Yorkshire** by **Frank and Harriet Wragg Elgee.** Methuen, pp. xvi-272, with two maps and sixty illustrations, 10/6. This volume is a very worthy addition to a useful series of County Archæologies published under the general editorship of Mr. T. D. Kendrick, of the British Museum. The authors have compressed into a comparatively small space a clear and connected account of the antiquities of Yorkshire down to those of Anglo-Viking times. The book is the only comprehensive one of its kind and although its style is quite appropriate to the general reader and enquiring tourist, the references to detailed monographs, archæological literature and other learned works will render this account invaluable to the serious student. The illustrations are excellent.

The high standard of Messrs. Methuen's series of biological monographs is fully maintained in the most recent of the series on **Sex Determination**, by **Professor F. A. E. Crew.** This is an authoritative and full summary of the relation between sex in plants and animals, and the chromosomal composition of the cells and gametes. It is thoroughly up to date and may be recommended to students in general and to those interested in problems of heredity.

**The Transactions of the Bose Research Institute, Calcutta** (published by Longman's) inaugurate with Vol. VII a wider series of researches than the well-known botanical ones. The papers deal with subjects such as fish-eating spiders, the capture of fish by drugging a stream, the locomotor paralysis of fish induced by various reagents, Burmese crania and the radio active character of springs.

## NEWS FROM THE MAGAZINES.

We have received from Messrs. H. F. and G. Witherby a reprint of the various interesting articles appearing in *British Birds* on 'The Great Crested Grebe Enquiry, 1931,' by T. H. Harrison and P. A. D. Hollom, which is sold at the low price of half-a-crown. We feel sure many of our readers would like to have this record.

*The New Phytologist* for December contains 'New and Little-known Algæ from the Beds of Rivers,' by R. W. Butcher; 'Meiosis in Diploid and Triploid *Hemerocallis*,' by S. O. S. Dark; 'Experiments on the Perception of Gravity by Roots,' by Lilian E. Hawker; '*Fritschiella*, a New Terrestrial Member of the Chaetophoraceæ,' by M. O. P. Iyengar; and 'Growth-regulators in Plants,' by R. Snow.

The Fifty-fourth Annual Report of the Victoria Park Museum at St. Helens reads as under:—'The most important additions to the Museum are a collection of 133 specimens of British Fossils, presented by A. Cecil Pilkington, Esq., and a Cormorant (*Phalacrocorax carbo*) shot at Thatto Heath Dam, St. Helens, October 4th, 1931, presented by Inspector Martin, N.S.P.C.A. The mineral specimens which formerly occupied small showcases in No. 2 room, have been removed and placed in a cabinet in the Hall, and the space thus vacated has been used for a large new showcase.'

## NORTHERN NEWS.

The Entomological Society of London completes the first hundred years of its existence on May 3rd, 1933, and will celebrate its centenary on that and the following day. A General Meeting of the Society for the reception of delegates and presentation of addresses will be held in the rooms of the Royal Geographical Society, Kensington Gore. It will be followed by a scientific conversazione to which Fellows are invited to bring exhibits.

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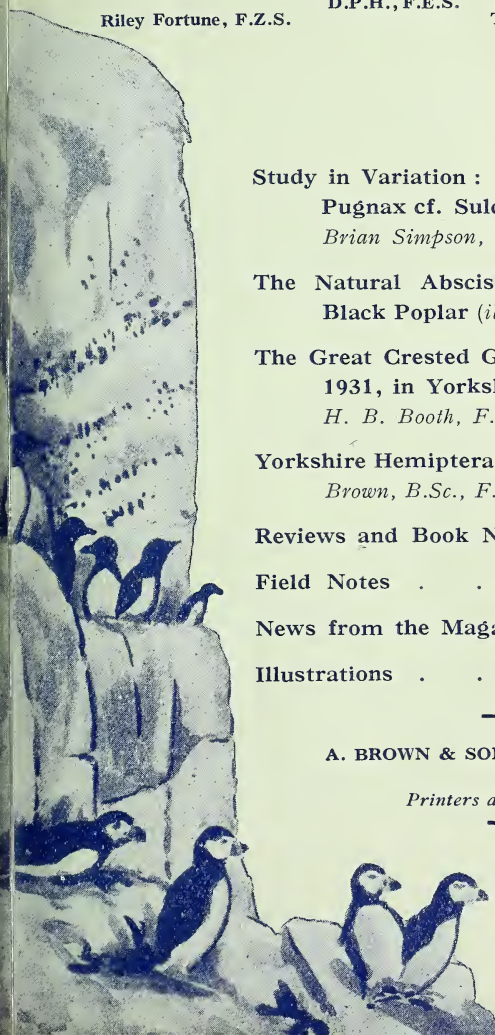

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# A STUDY IN VARIATION: *PUGNAX PUGNUS* (Martin) and *PUGNAX cf. SULCATUS* (J. de C. Sow).

BRIAN SIMPSON, M.Sc., UNIVERSITY COLLEGE, SWANSEA.

(*Continued from page* 61).

The most obvious variants are *depth* and *thickness*, for the tumidity or thinness of the specimens is readily seen. The relation $\frac{depth}{breadth} \times 100$ is seen in Fig. 3 C, and again the largest number of specimens lies within narrow limits 50 per cent.—70 per cent. and includes the mature specimens, while the larger specimens approach 100 per cent. with the depth and breadth nearly equal; such specimens are very tumid as seen in Fig. 2. The mean is 61.48 and the arithmetic

**Fig. 4a.**

mean of the deviations is 8.62 or 12.39 per cent. of the mean. These figures are low and as would be expected are very near those of the succeeding factor $\frac{thickness}{breadth} \times 100$. Here the range is high, being 41 per cent., and contrary to the other variants the specimens are not confined within narrow limits,



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but are more evenly spread out, indicating the possibility of a stout specimen even at an early age. The arithmetic mean of the deviations is 6.642 or 12.26 per cent. of the mean, so that the general conclusion is that the specimens of *Pugnax pugnus* Martin have a tendency to rotundity in all phases of growth.

VARIATION IN *Pugnax* cf. *sulcatus* (J. de C. Sow)—The second form which is contained within the lesser peaks does

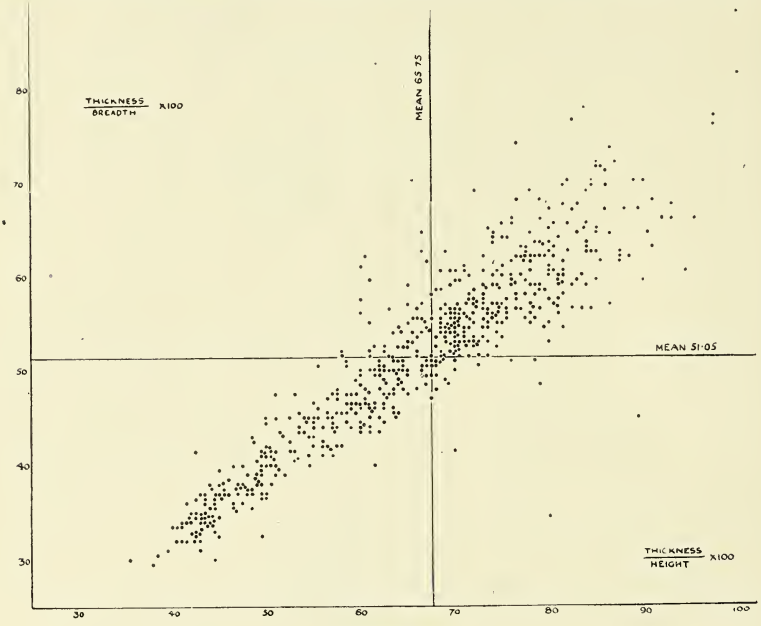


**Fig. 4b.**

not fall readily into any species, but the nearest named species is *Pugnax sulcatus* (J. de C. Sow). Parkinson (4) in describing this species says: '*Pugnax sulcatus*, as here interpreted, even excluding the varieties described below, varies within somewhat wide limits. Occasional specimens are almost identical with the type (5) but the majority are smaller and rather more flattened.' The species here considered is very like the one figured by Parkinson (6) as a transitional form between *sulcatus* and the forms with a rounded sinus.

In this species there is no need to examine the relation $\frac{height}{breadth} \times 100$ since it would give the same results as in the case of *Pugnax pugnus* (Martin).

The relation $\frac{thickness}{height} \times 100$ shews the mean relation to

be 51.44, this relation accounting for the late appearance of the specimens. The variation of 7.845 or 15.25 per cent. of the mean is low and indicates the low deviation within the confines of these factors. The range of form in the group shows a range of 39.5 per cent., the majority occurring above the mean.

The variant *depth* and *thickness* show greater deviation than any of the others. Considering first the relation

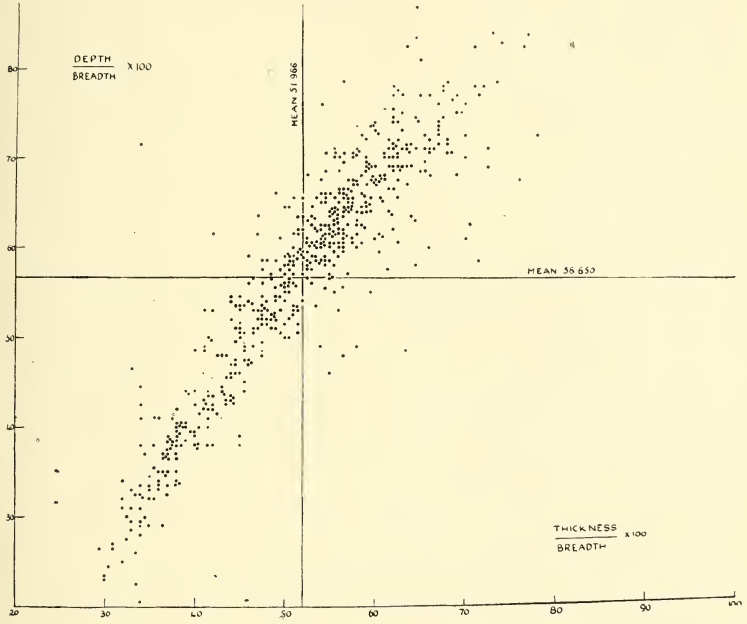


**Fig. 5.**

$\frac{breadth}{depth} \times 100$. The mean relation is 42.48 and the arithmetic mean deviation is 9.34 or 21.98 per cent of the mean. The range is considerable, being 45.7 per cent.

In the case of $\frac{thickness}{breadth} \times 100$ there is a mean value of 40.89 and an arithmetic mean of 6.169 or 15.08 per cent. of the mean. The range here is less than in any of the other variants, being only 39 per cent.

The Scatter Diagrams.—The three scatter diagrams Figs. 4 and 5 show that the correlated factors are the same in each of the species.

The plotting of $\frac{thickness}{breadth} \times 100$ against $\frac{height}{breadth} \times 100$ gives an even scatter over the four quadrants and thus shows the low correlation existing between the variants included in the

scatter. (Fig. 4 A.) The remaining diagrams shew a distribution of the dots in two diagonally opposite quadrants. First the plotting of $\frac{thickness}{breadth} \times 100$ against $\frac{thickness}{height} \times 100$ is seen in Fig. 4 B. while the plotting of $\frac{depth}{breadth} \times 100$ against $\frac{thickness}{breadth} \times 100$ is seen in Fig. 5 the difference from the preceding one being that the diagonal of the scatter group is slightly steeper.

Ribbing.—The ribs of the pedicle valve are present in

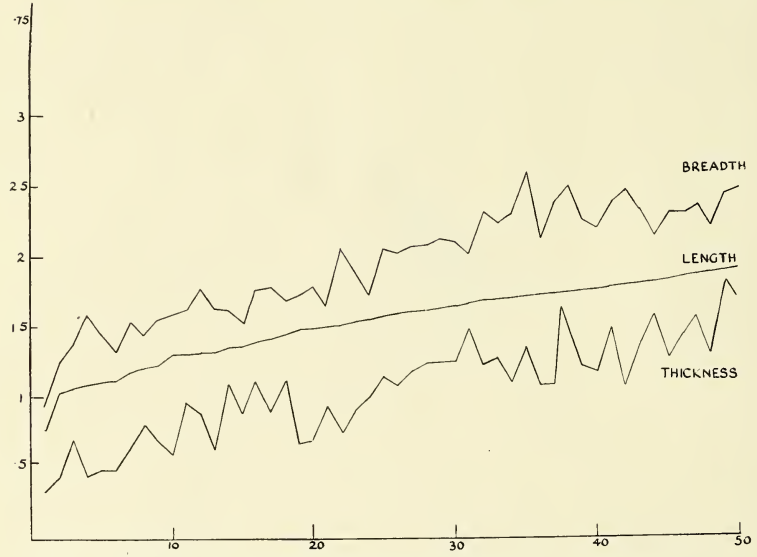


**Fig. 7. Illustrating the progressive change in breadth, length and thickness in fifty selected specimens.**

the very young specimens as a crimping along the posterior margin, but in the very large specimens they almost reach the umbone. The number of ribs in the pedicle valve of *Pugnax pugnus* (Martin) varies from 0—12 in the specimens observed. The number of ribs in the furrow is always one fewer than that of the ridge. In *Pugnax* cf. *sulcatus* (J. de C. Sow) the number of ribs in the pedicle valve ranges from 0—12, and the same fact of one more rib on the ridge than in the furrow is true in this case also. The ribs are developed first in the furrow and on the ridge, and become stronger on the sides with later growth.

Conclusion.—In conclusion the following facts emerge, that :

1. The group of six hundred specimens has been shown to consist of two species. This has been demonstrated by the frequency polygons.

2. The two species are: *Pugnax pugnus* (Martin); *Pugnax* cf. *sulcatus* (J. de C. Sow).

3. The *height* and *breadth* of *Pugnax pugnus* increase at a steady rate and thus give no wide variation in the percentage ratios.

4. There is a high degree of correlation between *thickness* and *breadth*, and *depth* and *thickness* in both species, as demonstrated by the scatter diagrams.

Finally, fifty specimens of *Pugnax pugnus* (Martin) have been selected and the three variants *length*, *breadth* and *thickness* plotted on a graph Fig. 7. This shews that the *length* is always greater than the *thickness* and less than the *breadth*.

I wish to record my thanks to Professor A. E. Trueman and to Mr. A. Stuart, M.Sc., for their help and criticism during the work.

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5. Sowerby, J. de C.: *Mineral Conchology*, Vol. 5, p. 153, plate 495, 1.
6. Parkinson: *loc. cit.*, plate 14, 2a.

In addition see:

Phillips: *Geology of Yorkshire*, Pt. 2, plate 12.
Brown: *Fossil Conchology*, Plate 56.
Hall & Clarke: *Nat. Hist., New York*, Part 6, *Palaeo*, Vol. 8, *Brachiopda.*

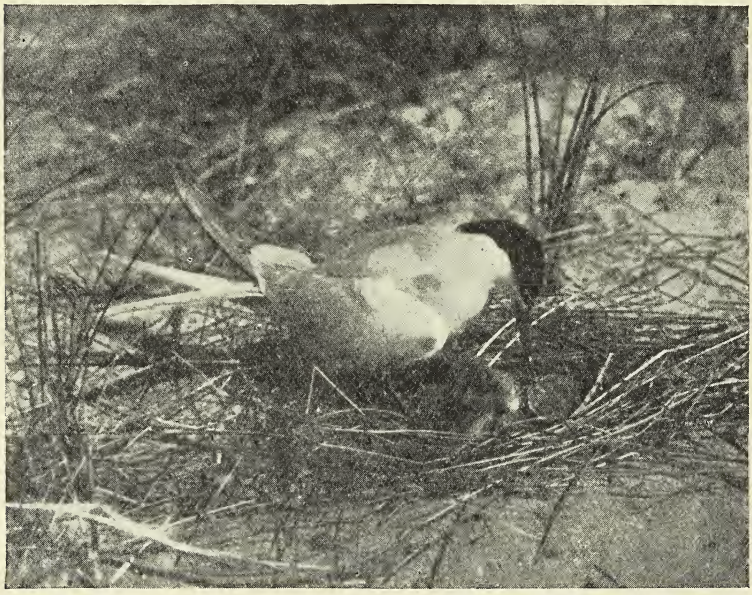
## REVIEWS AND BOOK NOTICES.

**A Romany in the Country**, by **G. Bramwell Evens.** London: The Epworth Press, 182 pp., 3/6. We have previously had the pleasure of referring to 'The Tramp's' delightful stories. He continues them with the present volume, which is not only illustrated by reproductions from photographs, but by extraordinary quaint drawings by his son, G. K. Evens. One of the photographs shows a young cuckoo in the act of heaving out of the nest the hedge sparrow's egg, and the attitudes assumed by this day-old youngster are very human. How Animals Eat; How Birds Fly; Early Nests; Corncrake; Otter; and a whole host of animals as well as general notes on Keeper and Poacher; Harvest Field; etc., fill this delightful volume.

**Australian Finches in Bush and Aviary**, by **Neville W. Cayley.** London: The Australian Book Co., 16 Farringdon Avenue, xix.+256 pp., 12/6 net. This volume, published by Angus & Robertson, of Australia, will appeal equally to keepers of aviaries and field naturalists alike. The wealth of small finches and similar birds in Australia is extraordinary, and in one case nearly 40 species of finch are described. The photographs and sketches of the birds and their nests, the maps showing distribution and the coloured illustrations, as well as typical finch aviaries, assist in making the book invaluable to bird fanciers. There are also chapters on Among the Finches in their Natural Haunts, by E. W. Jones; General Hints on Housing, by Frank Buckle; Good

Health, by L. J. Clendinnen ; The Commoner Ailments of Cage-Birds, by E. A. D'Ombrain.

**Strange Happenings in Wild Life** by **George Hearn**, with foreword by The Marquess of Tavistock, pp. 288 and 112 illustrations, Hutchinson, 15/-. This book is worth having if only for the emphasis it lays on the individuality of wild creatures. All cautious trained observers are to-day aware that the ' average ' conduct of a species is no complete



*By courtesy of* ] [*Messrs. Hutchinson Publishers, Ltd.*

**Common tern assisting her chick to get out of the egg-shell by breaking it from the outside.**

guide to the doings of any one member, and Mr. Hearn has collected in this charming book a host of new records of bird and animal behaviour. The letter press is accompanied by a large number of photographic illustrations, some of which are delightfully appropriate to the text and of outstanding merit. One of these is reproduced above.

**A History of the Birds of Suffolk**, by **Claud B. Ticehurst.** London : Gurney & Jackson, xi+502 pp., 24/- net. Bird lovers will be grateful to the late J. H. Gurney for suggesting to the author of this book that he should prepare a volume dealing with the Avifauna of Suffolk. Naturalists owe a debt of gratitude for the admirable way in which the valuable notes have been printed and illustrated. Yorkshire led the way in publishing the two volumes on the Birds of Yorkshire, under the auspices of the Yorkshire Naturalists' Union, since when a large number of counties have been covered in a similar way. The substantial volume before us—the last of a long series—is equal to anything which has previously appeared, and before long naturalists will have the pleasure of knowing that practically every part of the British Islands has been covered in this way. At the end of the book is a bibliography and a map to illustrate a history of the birds of Suffolk.

# THE NATURAL ABSCISSION OF TWIGS IN CANADIAN BLACK POPLAR.

## (*Populus serotina Hartig*).

MARY THOMAS, B.Sc.

Introduction.—A comparison of saplings with adult trees of the same species shows a striking difference in the distribution of twigs on the branches. The branch of the young tree usually has lateral branches down almost its whole length, except for a short distance just above and below the ring of bud scale scars, where a few of the buds remain dormant and fail to produce twigs. On the other hand, the branches of the older tree only bear laterals at spaced intervals. The means by which this spacing is effected, as the tree gets older, is probably different in different species and the present paper is simply concerned with one type in which this clearing process is largely due to a natural process of abscission (1 and 2). In England, the ground under trees of the Canadian Black Poplar (*P. serotina* Hartig) or the Oaks, in August or September is usually strewn with twigs which have fallen from the tree as the result of a clean separation which is quite distinct from a mechanical break. So constant is the appearance of the somewhat convex end of the twig and the concave scar left on the tree that it is clearly related to the structure of the twigs in this region, and the present investigation was undertaken to study the changes leading to abscission. The details have only been examined for *P. serotina*, though certain general observations suggest that the problem is similar in the Oak.

Morphology.—The morphology of *P. serotina* is so closely bound up with the periodic growth processes of the tree, that it seems best to approach the consideration of the form of the twigs and the branch system generally, from this aspect. If the current year's shoot is examined when in leaf, it is found that the lowest leaves are small, but leaves of increasing size then succeed one another until a maximum size is reached a little beyond half way along the shoot, beyond which the size falls off again towards the new terminal bud. Closely related to leaf size are many other features of shoot growth which, if graphically represented, would give identical curves. To draw attention to the more important of these, the following features may be mentioned.

(*a*) Size of the buds in the axils of the leaves.
(*b*) Vigour and length of the branches derived from these buds.
(*c*) Order of opening of the buds (with the additional

point that the terminal bud is the first to open in spring).

(*d*) Order of fall of lateral branches along the length of a year's extension growth.

(*e*) The order in which, in the transition to the flowering stage, the buds pass into the reproductive phase. The most vigorous buds in the axils of the biggest leaves are the first to change from leaf-bearing to catkin-bearing buds.

If a second year twig is examined, it is usual to find that the lowermost buds have been so small that they have remained dormant, that those immediately above have grown out into lateral branches, which are weak (being derived from relatively small buds and having grown out relatively late) and have made very insignificant growth, whilst the most vigorous and well developed shoots are to be found a little above half way up the shoot. (Fig. 1.) If a comparable region is examined over a number of annual growth increments, it is found that the lower branches, which made poor growth, are shed—usually in almost regular sequence, until finally only one or two (or occasionally none) of the most vigorous laterals have resisted the abscission process, these being situated a little beyond half way along the extension growth of the particular year's growth. So characteristic is the distribution of the laterals that a reasonably accurate estimate of the age of a branch system may be obtained by counting the number of groups of (or single) laterals separated by a length of axis free from laterals.

When the trees are about 20-25 years old the upper branches begin to flower. The change is gradual and at first only one or two of the buds may be catkin-bearing on an otherwise vegetative shoot. The catkin buds can be recognised from the lateral vegetative buds by their larger size. They are also relatively shorter and fatter. The terminal bud is about the same size as the catkin buds, but in all cases remains vegetative. Another feature associated with the development of a catkin bud is that the leaf cushion of the subtending leaf is more swollen, so that the cylindrical bud comes to be situated on a relatively wide notch, on which a circular scar is left when the catkin falls. The vegetative buds are more closely adpressed to the stem and are attached by a narrower base, which is much less conspicuous than that of the catkin bud. As more and more of the buds become reproductive this seating of the scar above a swollen cushion gives the twigs a very different appearance from the vegetative. The catkin-bearing twigs appear stouter and more irregular in outline and are also more rigid than the long pliable vegetative shoots. In the final stage of a reproductive twig, catkin buds

**Fig. 1. Twig of *Populus serotina* Hartig, showing periodicity in the vigour of lateral branches.**

(each of which contains merely a staminate catkin enclosed by bud scales, the catkin falling after liberation of the pollen) occur in the axils of all the leaves. In comparatively rare cases one of the buds, usually one occurring just above or below the zone of reproductive buds, may be vegetative and grow out giving rise to a lateral twig, but this is not common. Thus the reproductive branch system may continue year after year without any laterals. This does not necessarily mean that these unbranched shoots are very long, as the new extension growth, added each year, becomes less and less the longer the particular system has been reproductive.

A further point of morphological distinction between the vegetative and reproductive branches is that the latter are always much swollen just above their junction with the main axis, whilst the vegetative twigs make a smooth union. The swollen base may be correlated with the region of original bud scale scars although these soon become obliterated by the stretching and cracking of the bark.

When twigs are freshly fallen, *i.e.*, during the period extending from the end of July to about mid-October, they are found to be still living, often with green leaves and with apparently healthy buds. Examined morphologically their characters are found to agree with those of reproductive lateral branches. The terminal bud is vegetative, but the majority of, (or all) the others are catkin-containing. In every case the fallen reproductive lateral is found to have made very feeble extension growth for a few years prior to abscission. The separation of the branch takes place about half-way across the swollen base, but close examination shows that the break is actually below the bud scale scars, which fall with the branch.

It is clear from the appearance of young trees that young and feebly grown vegetative branches also fall, leaving a clean scar but these are insignificant in comparison with the fallen reproductive branches which may be as much as 18 years of age and several feet in length. It is mainly twigs of the latter type which have been examined in this work.

Structure of the Abscission Zone.—If the bark (cortex and phloem) is removed from the region of the branch union exposing the wood surface in vegetative and reproductive branches, a difference in structure of the basal part of the lateral is clearly shown by their behaviour on drying. The vegetative branch dries showing a smooth union with the axis, and whilst the reproductive shows a similar appearance along the length of the branch, the wood in the zone of about 0.5 cms., in width and situated about 0.5 cms. from the actual base of the branch, becomes much cracked and contracted on drying (Fig. 2).

Comparisons of the various types of branch unions are best

examined by cutting radial longitudinal sections through the union and using a stain which picks up lignified tissues, *e.g.*, safranin, together with a counter stain such as light green. Sections cut through the union of a one-year branch always show a difference in the vascular tissue just at the base of the branch. In this zone much of the lignified wood typical of the internodal region is replaced by parenchymatous tissue, which is conspicuous as a green band across the branch base. If two-year, three-year, etc., vegetative branches are examined

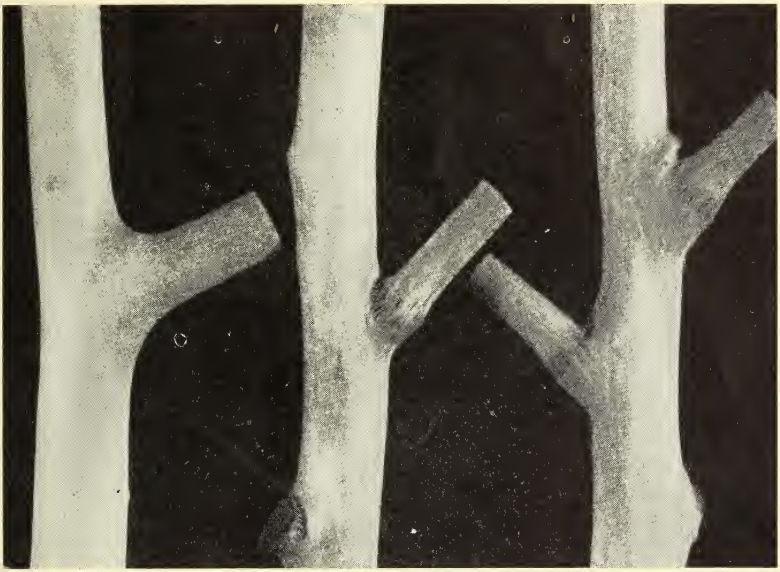


**Fig. 2. Branch unions in *Populus serotina* Hartig, with bark removed showing a smooth union in the vegetable branch (left) and a swollen in reproductive branches (centre and right), in which the woody tissues crack on drying.**

in a similar manner, the appearance of the basal region varies with the vigour of the branch. In those which are sufficiently vigorous, a union of lignified tissue across this zone is established relatively soon and such branches are likely to persist. In the weaker laterals the basal zone may fail to be bridged by lignified tissue in the second or even the third year, and obviously in such cases the basal parenchymatous zone will present a position of weakness, which cannot stand the strains to which it is subjected by the movements of the branch.

This parenchymatous zone is still more striking in the case of the reproductive branches which *never* make connection by lignified tissues (except to a very slight extent by isolated

series of vessel elements in the swollen mass of parenchymatous tissues).

A curious feature of the parenchymatous zone is the sharp delimitation from the lignified tissues above and below. It is probably located in the bud scale region and may possibly be related to the type of vascular structure initiated in the axis from these structures.

In the typical internodal region of branch or axis the wood consists of vessels and fibres, with a small proportion of wood parenchyma at the face of the summer wood and around the spring vessels. The rays are usually only one cell in width, and the spring and summer wood are sufficiently unlike one another for it to be possible to distinguish the annual rings, though these are relatively inconspicuous in this species. In the parenchymatous zone, on the other hand, the vessels are very few in number and are not accompanied by typical lignified fibres. The pitting on the vessel walls also differs from the usual ' pitted ' types and approximates to scalariform. The wood parenchyma is considerable in amount and the rays are several cells in width. The fibres of the typical wood appear to have been replaced by files of parenchymatous cells. All the living cells in this zone appear to be less differentiated than in normal wood and many of the parenchyma cells and ray cells appear to be practically unvacuolated.

The differentiation of the phloem undergoes comparable modifications in this zone. The sieve tubes and fibres of the typical phloem are substituted almost entirely by parenchyma.

The cells of the cambium are shorter than those of the internodal region, being only about $\frac{1}{2}$-$\frac{2}{3}$ the typical length. The cambial ring is also much interrupted by the numerous initials of the expanded rays.

Discussion.—It is now firmly established that cambial activity, followed by vascular differentiation, is initiated in the opening buds and extends basipetally down the shoot (3 and 4). The vigour of activity extending down the shoot varies with the vigour of the bud undergoing extension. It is interesting from this point of view to find that in *P. serotina* the abscissed twigs are the weak vegetative and the reproductive. The former are usually weak from the outset, being derived from small buds and usually opening late when they make little headway against the competition of the other growing shoots. Further, these branches are usually in such a position that they are likely to be developing under conditions of poor light. Thus the conditions are all adverse to a vigorous vascular differentiation. In the bud scale region the primary structure is evidently not conducive to a transmission of typical vascular differentiation, and although

activity of the cambium extends across this zone it is followed only by the peculiar differentiation of parenchyma unless the basipetal impulse is particularly strong.

It has been shown by Gill (unpublished work) that practically no cambial activity is initiated on the branch axis by the opening of the catkin buds and consequently the terminal bud is the only vegetative bud in the reproductive branch system to set in motion the basipetal differentiation. It is not surprising that in such shoots which remain reproductive year after year, the length of new extension added each year becomes less and less, and that cambial activity, though extending across the basal zone, is not sufficiently vigorous to be followed by typical differentiation.

The case of the oak has not been fully examined, but the abscissed branches may be very numerous. After a season in which the trees have been largely defoliated by caterpillar attack, the small abscissed twigs are seen in very large numbers, and similarly it appears that the slender twigs produced by secondary activity in warm damp summers are also readily abscissed. In the latter case the foliage is usually attacked by mildew and suffers as a result of the first frosts. In addition to these types of small twigs, larger twigs also fall and may be associated with reproduction, though this point needs confirmation. In the case of the small twigs, the facts would support the general conception that with poor vegetative activity the basipetal tendency to vascular differentiation is not sufficiently strong to bridge the bud scale region. The actual separation across the swollen base is very clean and would suggest that a definite absciss zone is differentiated in the swollen region, but so far no such layer has been recognised.

In many trees small branches which die (usually branches low on the trunk and thus shaded from light) are apparently pushed off by the expansion of the axis as it increases in girth around the base of such a dead branch. The loss of these branches in this manner gives rise to the bare unbranched trunk of the tree. The bark is thrown into folds and considerable force must be exerted on the branch (5). A force of this kind cannot be exerted to any appreciable extent in the case of the small vegetative and larger reproductive branches of Poplar, or of the twigs of Oak, as the abscissed branches are fresh and often fall with green leaves still upon them. In fact, the fallen branches look so fresh and living that their viability was tested by planting bases and tops of such fallen twigs as cuttings with controls from comparable twigs cut from the tree. Whilst a considerable number of the control twigs rooted, both vegetative and reproductive, none of those from fallen twigs made any growth at all. These results, coupled with an observation that the abscissed twigs contain

no starch, suggest that the abscissed twigs are exhausted of all food reserves.

On the reproductive branches for year after year all but the terminal bud are catkin bearing. The production of catkins involves the utilisation of food stores in the branch and as such buds consist only of bud scales and a male catkin which sheds pollen and then falls, their formation is merely a drain on the supplies in the shoot. The terminal bud of the branch alone produces leaves to replenish these supplies, so that year after year all the activities of the branch, including the production of new catkins, the new extension growth of the shoot and the annual girth increase right down the branch, are supplied by the food materials made by the few leaves from this bud. It is only natural that the extension growth of the shoot should get less and less, the longer the branch has been flowering and also that, as the branch gets longer, the vigour of cambial activity reaching the base of the branch should become more and more feeble as the food supplies become depleted. The parenchymatous zone, which replaces the typical vascular tissues in the basal region, constitutes a position of weakness which is eventually unable to support the strains to which the branch is subjected and abscission' results.

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## FIELD NOTES.

**Sparrow Hawk.**—On 12th March, in the garden of Mrs. Darby, 25 Lond Lane, Dalton, Huddersfield, while birds were feeding on crumbs thrown for them, a Sparrow Hawk swooped down, and, seizing a Starling in its talons, flew off with it.

This garden is at the side of a busy road, one-and-a-quarter miles from the centre of the town and in a fairly populous neighbourhood.—E. Gallwey.

**Little Owl.**—A live specimen of the Little Owl was brought in to the Tolson Memorial Museum, Ravensknowle, Huddersfield, on the 10th inst. which had been caught in the back garden of Rawthorpe Hall, Rawthorpe Lane, Dalton, Huddersfield.—E. Gallwey.

# THE GREAT CRESTED GREBE ENQUIRY AND CENSUS OF 1931, IN YORKSHIRE, AND A FEW LATER NOTES.

By H. B. Booth, F.Z.S., M.B.O.U.

This census was undertaken by two Cambridge undergraduates, Messrs. T. H. Harrisson, M.B.O.U., and P. A. D. Hollom, M.B.O.U., in conjunction with ' British Birds ' (mag.). The whole of England and Wales were divided out, usually into counties, and each was put in charge of a competent field ornithologist, who worked together with his friends and correspondents, but who made himself responsible for the full returns for his area. Everyone known to have assisted in any way was acknowledged in ' British Birds.' In this way, and with the assistance of my friends, I made myself responsible for the three Ridings of Yorkshire, knowing that practically almost the whole of the work would have to be done in the West Riding. This agreement was made on the understanding that when the general work was tabulated and published, I should read a more detailed account of our Yorkshire portion before the Vertebrate Zoology Section of the Y.N.U., with a view to publication in *The Naturalist* later. The mass of notes and reports collected and sent in were so enormous that it was well after the breeding season of 1932 before they could be tabulated and published. Parts were circulated in ' British Birds,' Vol. XXVI, 1932 (for August, pp. 62 to 91 ; September, pp. 102 to 131 ; October, pp. 142 to 155 ; and for November, pp. 174 to 195).[1]

In the first place, 1931 was a very wet spring and summer, which was very much more to the discomfort of the recorders than to the grebes. In many places it was difficult to approach their nesting environments, and on many of the reservoirs, such as those of the Leeds Waterworks in the Washburn Valley, where these birds usually have their nests stranded by the fall of the water, they had merely to add an inch or two more vegetable matter to their nests and probably never fared better.

In my reports and returns I had dealt with each Riding separately, and which I intend to do in the present paper ; but the compilers lumped the returns for the three Ridings together without any distinction, chiefly for the comparative county table, in which Yorkshire stood very high, having 66 pairs. Only one county got into a higher plane, viz. : Norfolk with its many Broads, and its estimated number of about 202 pairs !

## The East Riding.

*Hornsea Mere*.—This fine natural stretch of water and cover has probably been the home of the Great Crested Grebe from time immemorial and appears to be the only site in this Riding.

In 1844 Thos. Allis in his ' List of Yorkshire Birds ' for the British Association, wrote of this species, ' A. Strickland states that it breeds at Hornsea Mere, and probably used to be abundant in the Carrs.'[2] Clarke and Roebuck in their ' Handbook of Yorkshire Vertebrata,' published in 1881, on page 88 say, ' about half a dozen pairs breeding regularly at

[1] For those who wish to study the subject more concisely, or to keep it for reference, Messrs. H. F. and G. Witherby have made a reprint, which is very handy. It covers the whole subject investigated, and includes the comparative county map. It has paper covers, 97 pages, for 2/6 and is well worth the money to any field ornithologist ; from 326 High Holborn, London, W.C.1.

[2] *Birds of Yorkshire*, p. 738.

Hornsea Mere.' T. H. Nelson states that in 1888 ' no fewer than six nests were observed.'[1] George Bolam, who acted as bird watcher in 1912, says that Taylor, the old gamekeeper there, told him that when he (Taylor) came in 1882 the Grebes had dwindled down to a pair or two, but by 1892, under his care, there were eight nests, or the record known until then ! But be that as it may, and with better protection afforded to them by the Wild Birds and Eggs Protection Acts Committee of the Y.N.U., and with Taylor still the gamekeeper, in 1907 there were only three pairs, and in 1908 I could not possibly see more than two pairs, but each were accompanied by young. In 1911 Mr. E. W. Wade informed me that in spite of protection there were only three pairs of Great Crested Grebes on the Mere in 1910 and 1911.

Until then we had only employed a part-time bird watcher. But owing to the Bearded Tits having been released by Mr. W. H. St. Quintin, it was decided to engage a full-time watcher, and my friend George Bolam was engaged—I am afraid not at a living wage—but still it was all that we, the subscribers to the fund (for never a penny of the Y.N.U. finances has been taken), could afford. The Grebes appeared to benefit by a full-time watcher, and also by full-time recording for, obviously, a man who is there each day for thirteen weeks knows more than a man who makes a flying visit for a day or for half a day. Either due to his full-time watching, or more accurate recording, or both, Mr. Bolam reported six, or possibly seven, pairs of Great Crested Grebes in 1912 at Hornsea Mere, which was more satisfactory to our subscribers.[2]

From then onward, until and including 1926, there were usually about four pairs of Great Crested Grebes present—never less than three and never more than six pairs. In the meantime the number of Coots on the Mere had increased out of all proportion. Those members who were present at the Y.N.U. May excursion in 1926, and who were privileged to go in the boat, can never forget the sight of such great numbers of Coots that took to the air as the boat approached the Wassand end. They passed over us in great clouds. In January, 1927, the Coots were very severely shot down. An increase in the number of Great Crested Grebes immediately commenced, and ten pairs were counted by the watcher during the nesting seasons of 1929, 1930, 1931 and 1932, which appears to be about the maximum number that Hornsea Mere can carry.

### The North Riding.

Neither Clarke and Roebuck nor T. H. Nelson make any allusion to nesting sites in this Riding. But, as a schoolboy at York, I know that it nested on pools on Strensall Common, before it was drained for military purposes. In fact, it was here that I had my first introduction to this fine bird, I believe first in the year 1880, but certainly in 1881, as I saw it two years in succession, but never more than one pair at a time. I never succeeded in finding its eggs, and I had not then any idea what its empty nest was like and may quite easily have passed it amongst the several empty nests of water birds and Black-headed Gulls ; which latter birds were just being exterminated there, as never an egg was allowed to hatch—it was a very keen ' egging ' spot in those days. But I have seen two clutches of Great Crested Grebe's eggs, at the least, that were taken on Strensall Common. I also had the pleasure of seeing these extraordinary birds in the air there, which I have only on rare occasions seen since.

The pools were very shallow, only about knee-deep, and contained many leeches. We were told that they were Horse Leeches, but although I cannot speak for the species, I can vouch for it that they were very

[1] *Birds of Yorkshire*, p. 739.
[2] *The Naturalist*, 1913, p. 67.

plentiful, and that they had a great affection for our bare legs. I have often wondered since if the Great Crested Grebe would eat leeches, but I have never got any nearer to a solution of the question.

In 1931 three pairs were known to have nested in this Riding, viz. :—

*Castle Howard, near Malton.*—Two pairs have nested for many years and more in some years, viz. : in 1910. Believed to have first nested there (one pair) about 1890.

*Wigganthorpe*, eight miles due west of Malton.—One pair has nested regularly each year since about 1906.

A water in this Riding which one would expect the Great-Crested Grebe to nest regularly is Lake Gormire, near Northallerton, but for some unexplained reason these birds never nest there and rarely, if ever, visit it.

### The West Riding.

It is in this Riding that the great extension and colonization has taken place during the past forty years. Doubtless, there would be a few ancient nesting sites in the extreme south-east of the West Riding, such as on the pools of Thorne Waste or on the famous Potteric Carr, near Doncaster, before it was drained ; but I have never been able to obtain any reliable or satisfactory information on the matter. Clarke and Roebuck in 1881 dismissed the subject with that in 1865 one gentleman told another that it occasionally bred in the West Riding. As both the authors lived in Leeds it may be taken as certain that this occasional breeding was not in their neighbourhood. I know personally that T. H. Nelson tried very hard to obtain proof of its ancient nesting in the West Riding and failed.

In the Y.N.U. excursion circular for Thorne Waste on July 11th, 1907, the late Dr. H. H. Corbett gave the Great Crested Grebe amongst the list of birds that he had seen there in the nesting season.[1] In the excursion itself, in which Dr. Corbett was one of the leaders, the bird was not seen.

In the following list the number of sites tenanted in 1931 are given, together with the number of pairs and the date, or approximate date, when each site was first occupied.

| *Site.* | *Pairs in* 1931. | *Year of Colonization.* |
|---|---|---|
| Dring Houses, York | 3 | 1921 (1 pair). |
| Barlow Cuttings, near Selby | 3 | 1925 (1 pair). |
| Drax Hales, near Selby | 1 | 1930. |
| Drax H. and B. Cuttings, near Selby | 1 | 1931. |
| Walton Park, Wakefield | 1 | 1890 (about.) |
| Bretton Park, Lower Lake | 2 | 1906 (about). |
| Nostell Priory | 1 | 1892. |
| Ryhill Reservoir | 7 | 1890 (about). |
| Newmiller Dam, near Wakefield | 1 | 1909. |
| Fairburn, near Castleford | 16 | 1921 (3 pairs). |
| Worsborough Dam, near Barnsley | 1 | 1890 (about). |
| Rockley Dam, near Barnsley | 1 | 1931. |
| Thrybergh Reservoirs, near Rotherham | 2 | 1919 (about). |
| Harthill Big Pond, near Rotherham | 3 | 1890 (about). |
| Harewood Park | 2 | 1890 (about). |
| Washburn Reservoirs :— | | |
| (1) Fewston | 1 | 1902 (about). |
| (2) Swinsty | 2 | 1902 (about). |
| (3) Lindley | 1 | 1931. |
| Gouthwaite Reservoir | 1 | 1905 (about). |
| Chelker Reservoir, near Addingham | 1 | 1921. |
| Malham Tarn | 1 | 1921. |

[1] *Y.N.U. Transactions*, 1909.

| *Site.* | *Pairs in* 1931. | *Year of Colonization.* |
|---|---|---|
| Renishaw Park, Sheffield ... ... ... | 1 | Missed in 1930.[1] Nested for many years; one pair only. |

NOTES ON THE ABOVE.

I am sure that when I first visited Walton Park in the late nineties of last century, there were two or three pairs of Great-Crested Grebes on the lake. But Mr. Simpson, who resides at the hall, assures me that there has not been more than one pair yearly for the last ten years. This appears to be rather strange, as this large lake offers them security, and is noted by anglers for its roach and perch.

The only reason that I could assign when I was there on June 27th was a flock of Canadian Geese and a pair of Mute Swans with cygnets. The male swan, although he did not appear to interfere with the Grebes, was continuously and furiously driving the Canadian Geese all over the lake, thus causing a great commotion on the water, and I was assured that this was his daily routine.

The most extraordinary water affecting the increase of the Great Crested Grebe in the West Riding is Fairburn, a shallow lake of recent formation due to coal mine subsidence, and although approaching Hornsea Mere and Malham Tarn in area, is not on the map. Fortunately we have a good ornithological history of its growth from our fellow member, Mr. W. G. Bramley, who lived on its shore until 1926. It was at first occupied by a nesting colony of Black-Headed Gulls, a few pairs of which still remain in spite of the islands and tussocks each year becoming fewer as the water increases. But the history of the colony of Great Crested Grebes concerns this paper most, and is as follows. In 1921 there were three pairs; in 1922 two pairs; in 1923 six nests; in 1924 ten to twelve nests; in 1925 three pairs nested; in 1926 four pairs were seen with broods. For 1927 we have not any record. But during 1928, 1929 and 1930 there was an extraordinary increase; Mr. Arthur Whitaker, who visited Fairburn in each of these three years, assures me that there were at the very least twenty to twenty-five—and possibly even thirty—pairs present. On one visit in 1928 he saw sixteen nests with eggs without investigating the whole area. On May 31st, 1931, together with Mr. Bramley, we made a most careful search with the use of a boat, which usually had not sufficient water under it to float it. We returned ten and a half pairs as the total population of adult Great Crested Grebes. We found six nests with eggs and one pair already had four young on the water. Mr. Whitaker told me that I could easily double the number, so I made another very quiet and careful visit on August 3rd. On this occasion I counted fifteen pairs with young on the water, and another bird was sitting on a nest in the open water—possibly a second brood.

Besides the Grebes there were large numbers of Coots, many Black-headed Gulls, several Tufted and Shoveler Ducks, etc., and on May 31st no less than thirty-two derelict Mute Swans ! ! They were not nesting and were probably birds that had been driven away from other waters by mated pairs. How such a large assembly of birds could possibly get a living on such a shallow piece of water was a puzzle. Besides, I was assured on good local authority that the only fish it contained were sticklebacks and a few pike in the deeper drains. However, we saw two good-sized dead roach, and I managed to catch one in a bucket that had got into difficulties. This latter we took ashore still alive and

[1] I regret that I overlooked this site in my " British Birds " list The nest contained deeply incubated eggs on July 2nd, 1931.—(A. Whitaker).

much to the surprise of the natives. In 1932 I paid one short visit to Fairburn, but although I made no attempt to count the Great-Crested Grebes, they appeared to be in rather less numbers than in 1931.

There have usually been two pairs of Great-Crested Grebes nesting on Worsborough Dam for a great number of years ; occasionally three pairs, or only one pair. Only one pair was known to nest there in 1930 and in 1931.

The record for Harthill Big Pond was not mine—I did not know of it. Mr. R. Chislett kindly paid it a visit in August, 1932, on my behalf, and reported three adult birds ; but could not see anything of any young birds.

At Harewood Park the two pairs of Grebes had to leave their first nests and build second ones, both in 1931 and 1932, owing to the fall of the water due to repairs to the outlet.

On Chelker Reservoir the Great Crested Grebes usually remain a month or so and leave in April or early May. In 1921 and in 1931 a pair remained throughout the summer, but in neither year could a nest be found and no young were reared. In 1924 a pair remained and built a nest, which I am fairly sure was robbed, as it was at the shallow end and was conspicuous from the road. This reservoir contains only trout and minnows, if that should be any reason why young are not reared there.

At Malham Tarn the first nesting pair was in 1921. There were two pairs—and once three pairs—yearly during 1923 and 1927 inclusive. In 1928 nine Mute Swans were introduced, where there had not been any swans before, and the Grebes absented themselves in 1928 and 1929 ; but a pair returned and nested in 1930 and in 1931. (Three pairs again nested on the Dring Houses ponds in 1932).

Other waters that have been tenanted in various years, but not in 1931, are as follows :—

Upper Lake, Bretton Park, Wakefield. Two pairs usually nested until 1929, and one pair in 1930. Excessive weed growths and fish elements believed to be the cause for desertion.

Hamsworth Dam, near Ackworth. A pair first nested here in 1893, and each year a pair, and sometimes two pairs, nested regularly until about 1920. Since then it has not been tenanted. Reason—increase of—and annoyance by—pit boys.

Greasborough Dam, near Wentworth. A pair first nested here in 1907 and until 1927, when the dam was drained for alterations, and they never returned.

Ulley Pond, five miles south of Rotherham. One pair nested from 1921 to 1930 inclusive ; when the reeds in which they nested were cut down. They returned in 1931 but did not stay to nest.

Hazelwood Castle, near Wetherby. For many years a pair nested here each year until 1920, when the last nest was seen. No reason can be given for their discontinuation.

Ripley Park, near Harrogate. A pair successfully nested in 1904 and in 1905. A photograph of a nest and four eggs was taken on the Upper Lake in 1910. In most years a bird or a pair appears in March or April. A suitable water : only apparent objection a flock of noisy semi-domesticated Canadian geese.

Coniston Cold, near Bell Busk. One pair nested each year in 1914 to 1928 inclusive ; and was protected and encouraged by the late Col. Tottie. (I am pleased to add that a pair successfully nested here in 1932.) Large Pike in this lake are very destructive to the young of water-birds.

Waters in the West Riding where the Great Crested Grebe might be expected to nest, but have not been known to do so. Semmerwater I consider to be the most suitable nesting site in this Riding. It contains abundant fish foods, large area, quietude, and plenty of cover.

On August 2nd, 1932, Mr. W. F. Fearnley and I watched a single

unattached adult there for several hours ; but it did not show any sign of having nested—just fishing and sleeping.

Eshton Tarn, near Gargrave. Another apparently excellent nesting site. (There was fairly good evidence that a pair had nested—or had attempted to nest here—for the first time, in 1932[1]).

Thorpe Cuttings, near Selby. Mr. Jas. Kendall considers this to be the most suitable site in that neighbourhood. It is of quite a large area, with a proportion of reeds and cover. Yet in the Barlon Cuttings near by, the Railway Company have dumped hundreds of tons of rubbish into them during the last twelve months (1930 and 1931). Yet the Grebes have increased there ! !

I would like to draw attention to the great chain of reservoirs on the Lancashire border, on which the Great Crested Grebe never nests, and rarely visits.

### Stray Notes.

It will be gleaned from the foregoing notes that the increase and extension of the Great Crested Grebe in the West Riding commenced in 1890, or ten years after the passing of the Wild Birds' Protection Act. Although it is doubtful if the latter had very much effect on their increase. It was probably more due to the decrease by death of the numerous gunners, and also by the growth of public opinion against the killing of everything that was rare or beautiful.

Since 1890 the increase and colonization has gone steadily on ; although it has been somewhat spasmodic, some waters actually decreasing, but on the whole the increase has been general.

The Great Crested Grebe visits the West Riding chiefly for nesting purposes. It arrives from the end of February to April, and departs about September ; but its movements are largely governed by weather conditions. Any reports between these dates in the colder season, are those of passing birds, and are of little value.

My report on double broods is of little value because I was unable to follow it up, and most of my friends and correspondents appeared to have very little interest in it, as it occurs at the wane of the season. But I believe it to be unusual in Yorkshire. I can only report three cases, viz., one at Fairburn, and two at Dring Houses, and I am unable to say that in any of these cases the data was perfect.

As to the food of the Great Crested Grebe, I don't think that it refuses any species of fish that it can swallow. But I have always found that it had a partiality for Roach. Whether that is because Roach swim in shoals, and in still waters, and are an easy quarry to catch, is the chief reason.

As in ' British Birds ' I have given a full list of those assisted me in this inquiry, it is unnecessary to repeat them. But I would like to add the name of Mr. H. Shorney, of Dring Houses, York, from whom I have never heard directly, but no less than three of our mutual friends have sent me reports of his painstaking and valuable nature notes on this species.

On small waters this species vigorously drives intruders away, but on larger lakes, such as Harewood, regularly harbour two pairs, one at each end of the lake. At Fairburn there does not appear to be any rule at all. They are all mixed up, with several nests often within a few yards of each other.

### Supplementary Notes.

In the remarks and discussion after this paper was read, several members pointed out that although a few pairs nest a fiarly high altitude, such as at Malham Tarn (1200 feet a.s.c.) the Great Crested Grebe is really a bird of the low lands, and if such apparently suitable waters as Semmerwater and Malham Tarn would probably contain several nesting pairs if they were situated nearer to sea level.—H.B.B.

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[1] *The Naturalist*, 1932, p. 347.

# YORKSHIRE HEMIPTERA DURING 1929-1932.

James M. Brown, B.Sc., F.L.S., F.E.S.

During the past four seasons since my last general report on the Yorkshire Hemiptera (*The Naturalist*, 1929, p. 309), the weather has not been very favourable to these insects, yet several additions have been made to the county fauna, and our knowledge of the distribution of the members of the order has been considerably extended. The recent results are embodied in the accompanying lists.

Considerable alterations in nomenclature, especially in the generic names, must be made in our records to bring them into conformity with modern usage. The names here adopted are those recommended for use by Mr. W. E. China, of the South Kensington Museum.

In preparing these lists I have to thank several entomological friends for help in supplying either records or specimens ; in particular Dr. W. J. Fordham, Messrs. M. L. Thompson, W. D. Hincks, E. G. Bayford and J. Wood.

* Species new to the Vice-County. † Species new to the County.

## Heteroptera.

*Piezodorus lituratus* F. A single immature individual taken on Gorse, Allerthorpe Common, August, 1932.

*Pentatoma rufipes* L. Rather plentiful on Oak, Arncliffe Woods (Egton Bridge), August, 1930. 62.*

*Elasmucha grisea* L. Common on Birch, Allerthorpe Common, June, 1930, and August, 1932, and in Sandburn Woods, June, 1929.

*Elasmostethus interstinctus* L. Also on Birch, Glaisdale, August, 1930, and in Bishop Wood (Selby), July, 1931.

*Rhacognathus punctatus* L. A species previously known only from Skipwith, has now been taken at Allerthorpe Common, 1928 (W.J.F.), and in Sandburn Woods, June, 1929.

*Trapezonotus arenarius* L. Under Heather, Sandburn Woods, June, 1929.

*Scolopostethus decoratus* Hahn. Sandburn Woods, and Bishop Wood.

*Gastrodes ferrugineus* L. Previously known from Skipwith and Hornby, occurred in large numbers on Scots' Fir at Allerthorpe Common, June, 1930, and August, 1932.

*Dictyonota strichnocera* Fieb. Allerthorpe Common, August, 1931 (J. Wood).

*Tingis ampliata* Fieb. Obtained plentifully by sweeping among low plants, Allerthorpe Common, June, 1930.

*T. cardui* L. Plentiful among the spines on Thistle heads, Driffield, August, 1929.

*Coranus subapterus* De G. Again taken at Allerthorpe, 1928 (W.J.F.).

*Nabis flavomarginatum* Sch. Skipton, August, 1932.

*N. rugosa* L. Ruston Parva, August, 1929. 61*.

*Temnostethus pusillus* H.S. On old branches of Oak, Goredale, August, 1932. Short-winged forms only were noted.

*Acompocoris pygmæus* Fall. On Scots' Fir, Bishop Wood, July, 1931.

*Orius* (*Triphleps*) *majusculus* Reut. Ruston Parva, August, 1929.

*Microphysa elegantula* Baer. Numerous examples on the bark of Sycamore, including males and females, Millhouses (Sheffield), July, 1930. 63*.

*Phytocoris varipes* Boh. Ruston Parva, August, 1929. This species is peculiar in being the only species of the genus that keeps to ground vegetation. 61*.

*Calocoris roseomaculatus* De G. Allerthorpe, July, 1932 (W.D.H.).

*Stenotus bimaculatus* F. Obtained by sweeping roadside herbage, Ruston Parva, August, 1929.

*Dichrooscytus rufipennis* Fall. Plentiful on Scots' Fir, Selby, July, 1931 ; Bishop Wood, July, 1931 ; Houghton Woods (Market Weighton), July, 1931.

*Lygus contaminatus* Fall. On Birch, Sandburn Wood, Marr, July, 1929 ; Bishop Wood, July, 1931.

*L. campestris* L. (*pastinacæ*). On Angelica, Driffield, August, 1929.

*L. cervinus* H.S. Winterburn, August, 1932.

*L. rubricatus* Fall. On Scots Fir, Osmotherley, August, 1931, and Winterburn, August, 1932.

*Camptozygum pinastri* Fall. Also common on Scots Fir, Acklam, 1931 (M.L.T.). 62*. Houghton Woods, July, 1930 ; Bishop Wood, July, 1931.

*Pœciloscytus unifasciatus* F. Allerthorpe Common, July, 1928 (W.J.F.) 61.*

†*Polymerus nigritus* Fall. Osmotherley. August, 1931.

*Capsodes* (*Lopus*) *gothicus* L. On *Teucrium*, Sandsend, August, 1931. (*The Naturalist*, 1931, p. 356).

*Notostira erratica* L. Among roadside herbage, Bishop Wood, July, 1931.

†*Megalocerœa linearis* Fuess. Swept in quantity from roadside grasses, Ruston Parva, August, 1929.

*Bryocoris pteridis* Fall. On various ferns, Arncliffe Woods, August, 1930 ; Skipton, August, 1932.

*Macrolophus nubilis* H.S. Askham Bogs, 1931 (M.L.T.). 61*

*Brachycerœa* (*Dicyphus*) *constricta* Boh. Ecclesall Woods (Sheffield). 62.*

*Cyllocoris histrionicus* L. On Oak, Sandburn Woods, Houghton Woods, and Bishop Wood.

*Globiceps flavomaculatus* F. Allerthorpe Common, July, 1932 (W.D.H.), Houghton Wood, July, 1930.

*Cyrtorrhinus caricis* Fall. Plentiful among Rushes, Emswell, August, 1929.

*Orthotylus marginalis* Reut. On Sallow, Wyming Brook (Sheffield).

*O. viridinervis* Kb. Winterburn, August, 1932. 64.*

*O. prasius* Fall. On Elm, Emswell, August, 1929. 61.*

*O. ochrotrichus* D. and S. On Elm, Emswell.

*O. flavosparsus* Sahlb. Cleveland (M.L.T.). 62.*

*O. virescens* D. and S. (*chloropterus*). On Broom, Staintondale, September, 1927 (W.J.F.).

*O. erecitorum* Fall. Under heather, Osmotherley, August, 1931.

*Heterotoma merioptera* Scop. On roadside herbage and by sweeping low plants, Askham Bogs, July, 1931 (J. Wood) ; Ruston Parva, August, 1929.

*Heterocordylus tibialis* Hahn. On Broom, Allerthorpe Common, June, 1930.

*Lopus* (*Onychumenus*) *decolor* Fall. Among grass, Barmby Moor, May, 1928 (W.J.F.).

*Macrotylus solitarius* Mey. On *Stachys*, Barmby Moor, July, 1930 (W.J.F.), Osmotherley, August, 1931 (M.L.T.) ; Bishop Wood, July, 1931.

*M. paykulli* Mey. On *Ononis*, Ruston Parva.

*Harpocera thoracica* Fall. Barnsley, 1931 (E.G.B.), Helwith Moss, June, 1930. This is one of the earliest Capsids to appear.

*Phylus melanocephalus* L. Houghton Woods, Bishop Wood.

†*Plesiodema pinetellum* Zett. A northern species occurring on Scots Fir, which seems to be extending its range southwards. Sandburn Woods, June, 1930 (M.L.T.); Allerthorpe Common, June, 1930 (*The Naturalist*, 1932, p. 86.)

†*Psallus obscurellus* Fall. Also found on Scots Fir, Allerthorpe Common, June, 1930.

*Atractotomus magnicornis* Fall. Another species found on Scots Fir, Houghton Woods, Osmotherley, August, 1931; Winterburn, August, 1932.

*Plagiognathus albipennis* Fall. Forge Valley, August, 1922 (W.J.F.).

*Dipsocoris* (*Cryptostemma*) *alienum* H.S. Very plentiful in some places, under stones by the side of streams, chiefly in upland districts. Deep Dale (Barnard Castle), April, 1930, 65.* Ling Ghyll (Horton), June, 1930. 64.*

*Acanthia* (*Salda*) *saltatoria* L. Allerthorpe, 1928 (W.J.F.), Pickering, May, 1929.

*Chartoscirta* (*S.*) *cincta* H.S. Cleveland (M.L.T.), Emswell, August, 1929.

†*Corixa dentipes* Thoms. Hull, September, 1917 (G.B.W.). (See *The Naturalist*, 1929, p. 207.)

*C. affinis* Leach. Malham, March, 1929.

*Sigara* (*C.*) *hieroglyphica* Duf. Allerthorpe, November, 1929 (W.J.F.).

†*S. limitata* Fieb. Barmby Moor, October, 1929 (W.J.F.).

*S. striata* L. Malham, March, 1929; Driffield, August, 1929.

*S. fallenii* Fieb. Malham, March, 1929.

†*S. distincta* Fieb. Allerthorpe, June, 1921 (W.J.F.).

*Callicorixa præusta* Fieb. Kirkby Fell, March, 1929.

*Glenocorixa carinata* Sahlb. Kirkby Fell, March, 1929.

### Homoptera.

*Triecphora vulnerata* Illig. Ecclesall Woods (Sheffield), local, but very plentiful in places, among grass and on bracken.

*Centrotus cornutus* L. Grass Woods (Grassington).

*Ulopa reticulata* Fab. Sandburn Woods, beneath heather.

*Megophthalmus scanicus* Fall. Ruston Parva, August, 1929.

*Cicadella* (*Tettigonia*) *viridis* L. Locally plentiful among damp vegetation, King's Mill (Driffield), August, 1929.

†*Idiocerus tremulæ* Esel. On the moors near Langsett (W. R. Barker, *fide* E. G. Bayford).

*I. fulgidus* Fab. Allerthorpe Common, August, 1932.

*I. lituratus* Fall. Allerthorpe Common, 1932. Quite plentiful.

*Macropsis impura* Boh. On *Salix repens*, plentiful, Allerthorpe Common, 1930, Sandburn Woods, June, 1929.

*Agallia venosa* Fall. Ruston Parva, August, 1929.

†*Graphocræus ventralis* Fall. Plentiful among the damp vegetation, by the lake, Renishaw Park (near Sheffield), June, 1929.

*Deltocephalus thenii* Edw. Osmotherley, August, 1931. 62*.

†*D. normani* Scott. Also at Osmotherley, August, 1931. A species very much like the last and liable to be confused with it.

*D. socialis* Flor. Among grass, Coredale, August, 1932. 64*.

†*D. subulicola* Curt. North-east Coasts (M.L.T.). Among sand-sedge. 62*.

*Euscelis* (*Athysanus*) *lineolatus* Brullé. Acklam (M.L.T.). 62*. Ruston Parva.

*E. obsoletus* var. *piceus* Scott. Osmotherley, August, 1931.

*Limotettix quadrinotata* Fab. Ruston Parva, August, 1929.

*L. persimilis* Edw. Ruston Parva.

*L. nigricornis* Sahl. Emswell, August, 1929. 61*.

*Drylix* (*L.*) *striola* Fall. Eston Marshes (M.L.T.).

*Stictocoris flaveola* Boh. Bishop Wood (Selby). July, 1931. 61*.

*Cicadula variata* Fall. Osmotherley, August, 1931.
*C. fasciifrons* Edw. (*warioni*). Ssmotherley, August, 1931. 62*.
*C. sexnotata* Fall. Emswell, August, 1929. 61*.
*C. fieberi* Edw. (*frontalis*). Emswell.
*C. flavescens* Fab. Barnard Castle district. 65*. April, 1930. Pickering, May, 1929, Ryecroft Glen (Sheffield).
*Empoasca viridula* Fall. Pickering, May, 1929.
†*Typhlocyba jucunda* H.S. On Alders, Millhouses (Sheffield), July, 1929.
*T. douglasi* Edw. Arncliffe Woods (Egton Bridge), August, 1930. Marr. Sunderlandwick, August, 1929.
*T. lethierryi* Edw. Marr, July, 1929.
*T. tenerrima* H.S. On Brambles. Holmehouse Wood (J. Wood), Houghton Woods, Sandburn Woods.
*Zygina flammigera* Geof. Pickering, May, 1929.
*Cixius cunicularius* L. Wyming Brook (Sheffield), July, 1929.
*C. brachycranus* Scott. Houghton Woods, July, 1931. 61*. Whitwell Wood | Sheffield).
*C. similis* Kbm. Helwith Moss, June, 1930. 64*. Sandburn Woods.
*Delphacoides* (*Delphax*) *pellucida* Fab. Emswell, August, 1929. Bishop Wood, July, 1931. Pickering, May, 1929.
*D. difficilis* Edw. Helwith Moss, June, 1930. Sandburn Woods, June, 1929. 61*.
*D. discreta* Edw. Emswell.
*D. discolor* Boh. Helwith Moss, Pickering, Sandburn Woods, June, 1929. 61*.
*Dicranotropis hamata* Boh. Sandburn Woods, June, 1929. 61*. Short-winged forms only were met with.
*Stiroma albomarginata* Curt. Pickering, May, 1929. 62*.
*S. affinis* Fieb. Newton Beck (Pickering), March, 1929.
*Livia juncorum* Latr. Plentiful on *Juncus*, Ruston Parva, August, 1929.
*Rhinocola ericæ* Curt. Cleveland (M.L.T.). A small species sometimes very plentiful among heather.
*Aphalara nebulosa* Zett. Frequently very plentiful among the flowers of *Epilobium angustifolium*, Sandburn Woods. Ecclesall (Sheffield).
*A. calthæ* L. Sandburn Woods. 61*.
*Psylla sorbi* Edw. On Mountain Ash. Wyming Brook (Sheffield).
†*P. brunneipennis* Edw. Winterburn, August, 1932. 64*.
*P. melanoneura* Forst. Pickering, May, 1930.
*P. ambigua* Forst. Marr, July, 1929.
†*Trioza remota* Forst. On Oak, Pickering, May, 1929.
†*T. chenopodii* Reut. Eston (M.L.T.), abundant on *Atriplex*.

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## NEWS FROM THE MAGAZINES.

Among the contents of the *Transactions of the British Mycological Society* issued in November are ' Bacterial Canker of Plum Trees,' by H. Wormald ; ' A Useful List of the Entomogenous Fungi of Great Britain,' by T. Petch ; ' New Species of *Olpidium* occurring in the Root Hairs of Agrostis,' by Kathleen Sampson ; ' *Cercospora abae* on Field Beans,' by R. C. Woodward ; ' Common Names for Plant Diseases ' ; ' *Mortierella* isolated from Soil,' by Dorothy Dixon-Stewart ; ' Growth and Sporulation of an Organism belonging to the Group Species, *Aspergillus glaucus*,' by B. L. Chona ; and ' Potato Wilt Disease in England due to *Fusarium oxysporum*,' by B. L. Chona.

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# The NATURALIST

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## A MONTHLY ILLUSTRATED JOURNAL

PRINCIPALLY FOR THE NORTH OF ENGLAND.

*Edited by*

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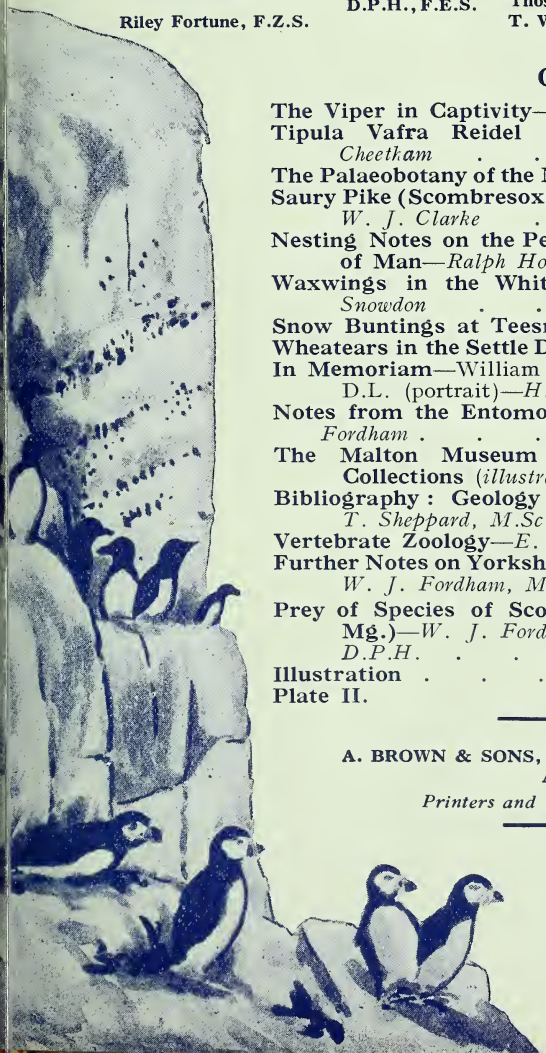

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# THE VIPER IN CAPTIVITY.

*Vipera* (*Pelias*) *berus*

BY ELLEN GALLWEY.

On 5th August, 1932, "Victoria," a fine specimen measuring 22 ins., was caught in Saddell, Kintyre, Argyllshire, by Dr. N. Morrison, of Campbeltown, who very kindly sent her to me on 5th September. At first she seemed to be very irritable, and hissed on the slightest provocation but after the first three weeks, *i.e.* seven weeks after capture, the hissing ceased.

The temperature was about 60 degrees F., varying slightly from day to day; *Sphagnum* covered the floor of half of her cage, and hay the other, whilst two or three elder branches were secured at an angle. A saucer of water, from which she occasionally drank freely, was always present, and she was forcibly fed once a week on raw hen egg, administered in the usual way.

She seldom lay about on the *sphagnum*, but seemed to be quite at home on the hay. No inclination to hibernation was shown.

She was handled every day, and at first resented the familiarity, but later allowed it. Victoria seemed to enjoy being stroked, as much as a snake can enjoy anything, and sometimes she would remain motionless, her head resting flat, whilst it was gently rubbed, or sit upright whilst her throat was tickled, just as Dr. Morrison records in his most interesting and instructive book, 'The Life Story of the Adder,' published by Alexander Gardner, Ltd., Paisley, 1924, p. 87.

Her excellent physical condition was maintained throughout, she seemed exceedingly friendly, or perhaps I should say tolerant, until 16th February, 1933, and was anything but 'languid, listless and sluggish.' She seemed 'the perfect pet' and was allowed every privilege, often accompanying me.

On 15th February, a black tom cat was in the Museum and a strong catty odour was prevailing when Victoria was taken from her cage next morning to be fed. After the removal of the funnel, she suddenly slipped my light grip and jumped deliberately 2 feet 6 ins. from the table top to the floor and promptly struck out at my ankles but missed. She straightway recoiled the latter part of her body, then struck out again, but just too late. She then stopped perfectly still for a few moments as if considering, then, although I was standing motionless about three feet away from her, she came quickly towards me with head raised about 4 ins. above the ground, jaws gaping wide open, displaying her erected fangs, and struck again at my ankles, a fraction of a second too late. She was evidently in a rage, and she sat back again, the latter part of her body slightly coiled, and the former raised about 4 ins. above the ground, swaying steadily from side to side in true cobra fashion, for some minutes. Throughout her activities she never once hissed.



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Afterwards she seemed as friendly (or tolerant ?) as ever. Three days later she was unusually active, and showed signs of anger ; she resented handling and seemed generally unreliable. Thinking she might like company, on the 21st I introduced two male grass snakes (*Natrix natrix*) into her cage and Victoria seemed friendly disposed towards the smaller, with which she used to bask.

Always after feeding, Victoria used to sit head erect for a few hours, but from now onwards she was often observed in this attitude, sometimes with her mouth slightly open, this being a sure sign of illness. She became more restless and resentful of handling so she was left in her cage undisturbed. However, there were intervals when she seemed more normal.

On 7th March I put into the cage for the grass snakes, two frogs (*Rana temporara*) which seemed to annoy and upset Victoria as they kept jumping about the cage. On the following afternoon she was lying dead, head propped erect in a corner of the cage, apparently in excellent condition still, after thirty-one weeks in captivity.

Dr. Morrison tells me, ' The average life of an adder in captivity is about six or seven weeks ; occasionally one may survive for ten or even twelve weeks, but these are rare exceptions. Therefore Victoria has created a record for longevity in confinement.'

From September 7th to September 21st Victoria was kept at my home in Long Lane, Dalton, then from September 21st to her death on March 8th, 1933, at the Tolson Memorial Museum, Huddersfield.

## TIPULA VAFRA *RIEDEL* IN YORKSHIRE.

CHRIS. A. CHEETHAM.

THERE is a small area of *Schoenus nigricans* at Thieves Moss, close to Sulber Gate, which lies about 1,200 feet O.D. at the head of Crummockdale. On the 14th of September last year, I saw one or two Tipulids here which looked like *Tipula alpium* or *T. marmorata* but flew rather quicker. I caught one but did not examine it until recently when I found it was *Tipula vafra* which has not been caught in England previously.

The species was first described by M. P. Riedel[1] from material collected in Finland, Lapland, and the Baltic coast of Germany. It was added to the British list in 1926 by Dr. F. W. Edwards, who found that a pair collected at Logie, Elgin, N.B., by F. Jenkinson, 13/9/04, belonged to this species. I think more could have been caught at the time I collected this specimen, but it seems to be a species with a short season late in the year.

[1] Abhl., Lehr, Nat., Crefeld, 1913.

# THE PALAEOBOTANY OF THE MIDGLEY GRIT.

JAMES WALTON
(*Technical College, Huddersfield*).

THE ' Main Third Grit ' or bed C of the Millstone Grit series is referred to as the ' Midgley Grit ' in the Midgley district, where it consists of a coarse grit having a thickness of about 80 ft. Further south a shale parting is developed and in the Colne Valley, where this shale bed has a thickness of 20 feet, the grit is termed the " Pule Hill Grit.'

At Sowerby are quarries exposing about 45 feet of grit which have yielded many plant remains in the past and the following have been recorded by Kidston.[1]

PTERIDOSPERMAE AND FILICALES.
*Alethopteris lonchitica* Schloth.
*Mariopteris nervosa* Brongt.
*Neuropteris heterophylla* Brongt.
*Neuropteris gigantea* Brongt.

CORDAITALES.
*Cordaites principalis* Germar.
*Artis approximata* Brongt.

EQUISETALES.
*Calamites suckowi* Brongt.

LYCOPODIALES.
*Lepidodendron aculeatum* Sternb.
*Lepidodendron obovatum* Sternb.
*Sigillaria tessellata* Brongt.
*Sigillaria scutellata* Brongt.
*Halonia tortuosa* L. and H.
*Stigmaria ficoides* Sternb.

Further south, at Krumlin, a thin shale-parting occurs, but the flora is similar to that at Sowerby. The Lycopodiales and Equisetales predominate and, of these, *Lepidodendron rimosum* and *Calamites suckowi* are the most abundant. The following have been collected :—

PTERIDOSPERMAE AND FILICALES.
*Diplotmema* sp.

EQUISETALES.
*Calamites suckowi* Brongt.

LYCOPODIALES.
*Lepidodendron obovatum* Sternb.
*Lepidodendron aculeatum* Sternb.
*Lepidodendron rimosum* Sternb.
*Sigillaria* sp.
*Bothrodendron* sp.

With the increasing thickness of the shale-parting there is also an increase in the number of Equisetales, Filicales and Pteridospermæ. The latter are chiefly found in the shale-parting below a marine band which shows a remarkable absence of Pterinopecten and goniatites. The plants collected from the Slaithwaite area are :—

PTERIDOSPERMAE AND FILICALES.
*Mariopteris acuta* Brongt.
*Neuropteris schlehani* Stur.
*Sphenopteris* sp.

LYCOPODIALES.
*Lepidodendron rimosum* Sternb.

EQUISETALES.
*Calamites undulatus* Sternb.
*Calamites carinatus* Sternb.
*Calamites suckowi* Brongt.

CORDAITALES.
*Artisia* sp.

The above were collected from Bar House and Shroggs

Quarries. The Filicales and Pteridospermæ occur chiefly in the shale-parting and, of these, *Neuropteris schlehani*, which is a diagnostic member of the Lanarkian flora, is the most abundant. *Lepidodendron rimosum* and *Calamites suckowi* are the most persistent over the whole area, although neither of these are of any zonal value.[2] The massive gritstone underlying the shale shows a greater number of Lycopodiales than Equisetales, whereas the reverse is the case with the raggy sandstone above the shale-parting.

In conclusion I would like to express my thanks to Dr. Crookall who has identified many of the plants in the foregoing lists and has given me considerable help in other directions.

REFERENCES.

1 Kidston, R. *Trans. Yorks. Nat. Union.* ' Reports on Yorkshire Carboniferous Flora,' 1890-1898.

2 Crookall, R. ' The Relative Value of Fossil Plants in the Stratigraphs of the Coal Measures.'' *Memoirs and Proceedings of the Manchester Lit. and Phil. Soc.*, Vol LXXVI, pp. 91-122.

## SAURY PIKE (SCOMBRESOX SAURUS) AT SCARBOROUGH.

W. J. CLARKE.

DURING December, 1932, and January, 1933, there appears to have been a migration of these fish along this part of the Yorkshire coast. The occurrence of ' Mackerel guides,' a local name given to the Garfish, washed ashore here and there, was reported on several different parts of the shore. The Garfish is a summer visitor much resembling the Saury Pike, and the unusual date, together with the information that slender silvery fish had been seen leaping from the water, made me suspect the presence of the Saury Pike, or ' Skipper,' a species which does not appear to have been recorded off the Yorkshire coast since the publication in 1881 of the ' Handbook of Yorkshire Vertebrata,' where it is recorded ' from Scarborough only.'

On January 21st a bather in the South Bay at Scarborough caught a Saury Pike as it swam past him, and brought it to me. It measured $14\frac{3}{4}$ inches in length, and was of a beautiful silvery blue colour.

On the same day another example, 13 inches long, was brought to me from Burniston Bay, where it was found stranded and dead upon the beach.

On January 26th a third example was seen to leap ashore in Filey Bay. It was picked up and placed in the water, but insisted in returning again. A life-sized sketch of this fish sent to me by Mr. Hyde-Parker enabled me to identify it.

## NESTING NOTES OF THE PEREGRINE FALCON IN THE ISLE OF MAN.

RALPH HOWARTH.

THE four eggs were taken from the nest of a Peregrine Falcon (Falco *p. peregrinus*) near Peel on April 17th, 1930.

The birds were not seen again at their nesting site that season, and a careful watch was kept in the vicinity during the remainder of the breeding season, but there were no indications of the Falcons having a second clutch.[1]

The following season (1931), the pair nested about half a mile south of the 1930 site, where a clutch of five, an unusually large number, were laid.

Usually the nesting site of the Peregrine Falcon is most difficult of access, and the assistance of a rope, a ladder, or both, are often necessary to those wishing to visit the eyrie. Such, however, was not the case last year (1932) at a nesting site in the Isle of Man.

The eggs were laid on a sheep track on the slopes above the cliffs overlooking the sea. These were accidentally discovered and taken by a local youth whilst in search of Gull's eggs for food. A remarkable feature of the incident was that this youth has such bad eyesight that he can ' hardly see the length of his nose.'

This is probably the only case on record where the eggs of the Peregrine Falcon have been taken for food.

## WAXWINGS IN THE WHITBY DISTRICT, 1932-33.

F. SNOWDON.

WHEN the Waxwing visits Yorkshire it is almost certain to be found in the Whitby district. During the late autumn and winter we have had it in more than usual numbers. It was first noticed on November 8th, when four were seen on the outskirts of the town. On November 24th fifteen were observed about half a mile inland, on some rough ground well furnished with wild rose bushes, which the birds always frequent when they visit this part of the county. Although it is quite close to the railway on which trains are constantly passing, the birds are not much disturbed.

Twenty-two birds were counted on November 25th at the

[1] I happened to be in the Isle of Man when these eggs were robbed—presumably by an English visitor who came over for the purpose—and I particularly asked Mr. Howarth and his friend to keep a good look out to see if the birds returned to the neighbourhood and laid again. My reason for this was because I have invariably found when the eggs or young of this Falcon are taken, the old birds leave the neighbourhood for that season at the least. But I have friends who contend that if the eggs are taken, another clutch will be laid by the same pair, at, or near, the eyrie, a few weeks later.—H.B.B.

same place, where they come feeding on rose-hips. Small parties were seen almost daily until December 16th and 22nd, which were fine, genial, sunny days, when eleven birds were very busy feeding on insects which they took in the air by making short flights after the manner of flycatchers. These proceedings were very interesting as they are not often observed. About twelve birds were seen in another part of the district on December 29th, and on December 31st nine were noticed near Sleights, about three miles inland from Whitby, which village they often visit to feed on the berries of the cotoneaster, of which they appear to be very fond. After this date no birds were seen in the immediate vicinity of Whitby, but on January 4th about twenty were observed near Robin Hood's Bay feeding on rose-hips, possibly our birds which had passed on. Usually the birds which visit us disappear about the end of December, and nothing more is seen of them in the neighbourhood, but sometimes odd birds remain until April. The fact that the birds leave an abundance of berries behind them suggests that it is not a lack of food which causes them to move.

## SNOW BUNTINGS AT TEESMOUTH.

W. F. FEARNLEY.

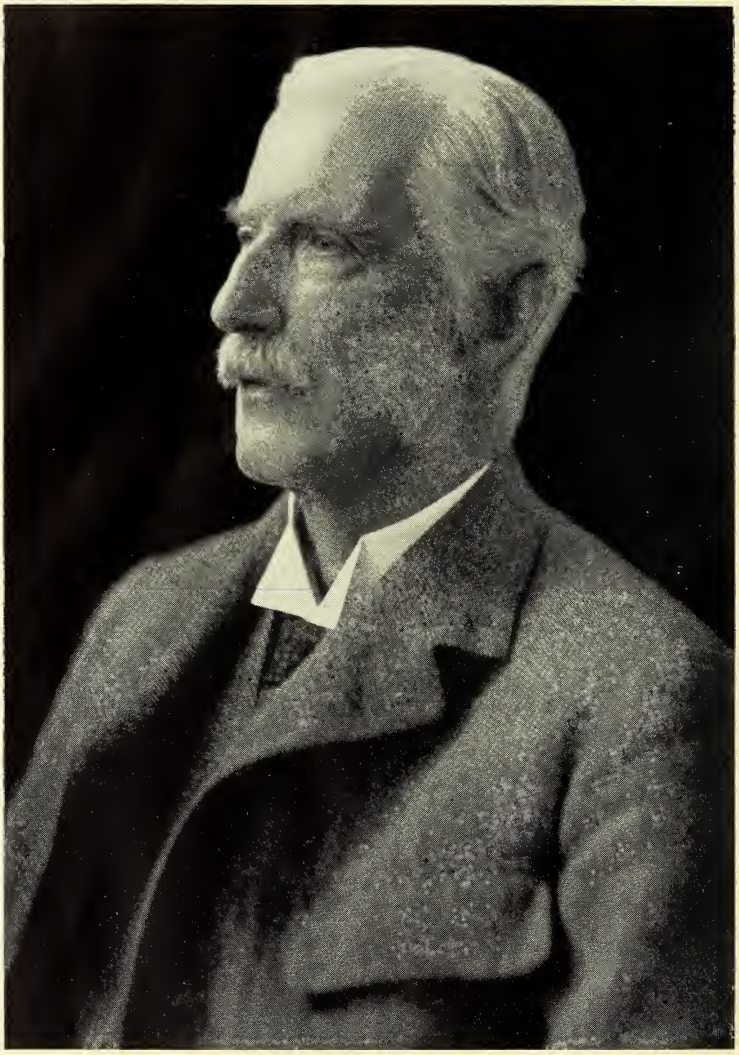
On October 30th, Mr. J. L. Illingworth and myself saw a flock of about fifty Snow Buntings at the mouth of the Tees. When first seen they were amongst the tufts of grass on the river side of the north breakwater, and only flew about thirty yards when disturbed. Later they were feeding amongst the huts near by and when we left at sunset they were indulging in more extended flights over the adjoining golf course.

## WHEATEARS IN THE SETTLE DISTRICT.

CHRIS. A. CHEETHAM.

Wheatears were seen near Cockett Moss, Giggleswick, on March 24th ; and on Penyghent and Moughton Scar on March 25th, this is earlier than last year when I first saw them here on April 1st. The fine, bright weather of this year is very different to the cold windy spell we had at the end of March in 1932, and this is possibly the reason for the earlier arrival of this migrant.

The spring flowers have come out quickly, and on March 22nd the wood anemones, sweet violets, marsh marigolds and crowberry had joined the primroses and celandines whilst the daphnes and purple saxifrage had lost their early freshness. On the 28th a small tortoiseshell butterfly was seen on the celandines in the bright sunshine.



WILLIAM HERBERT ST. QUINTIN, J.P., D.L.
(1851-1933).

# In Memoriam.

## WILLIAM HERBERT ST. QUINTIN, J.P., D.L. (1851—1933).

YORKSHIRE, and particularly Yorkshire naturalists, are much poorer by the passing of W. H. St. Quintin, on January 21st, at Scampston Hall, where he was Lord of the Manor, and also of several surrounding Manors. He was a very fine type of Yorkshire gentleman, and belonged to one of the oldest settled families in Yorkshire : being in direct lineal descent from Sir Henry St. Quintin, whose name appears on the roll of Battle Abbey, and was a companion in arms with William the Conqueror.[1]

He was the oldest East Riding magistrate, being appointed in 1875 ; alderman of the East Riding County Council, and one of its original members ; a former Chairman of the East Riding Quarter Sessions, and acted as High Sheriff for Yorkshire in 1899. He was also Chairman of the Yorkshire Fisheries Board, and President of the Yorkshire Philosophical Society.

But it is in Natural History that we know him best, and valued his immense knowledge ; always freely given to those who wished it. He joined the Yorkshire Naturalists' Union in 1890, was its President in 1909, and for thirty years was Chairman of its Wild Birds' and Eggs' Protection Acts Committee, and a liberal supporter to its funds. From time to time he contributed valuable articles and notes to *The Naturalist*.

He took up falconry in earnest in 1880, in conjunction with his life-long friend, Mr. E. G. B. Meade-Waldo (who were at Eton together).

Eventually he gave it up in favour of aviculture, and what a delight it was to accompany him round his paddocks, ponds and aviaries, at Scampston !

He was an original member of the Avicultural Society, and in its early days contributed to its magazine. The Zoological Society of London, and also the London Parks, were much indebted to him, to both of which he had presented many valuable waterfowl, and other birds. I believe that he is the only one who has bred the Little Bustard, and he was the first to breed the Roller and the Tragopans.

He was also a first-rate entomologist and botanist, specializing in Orchids—in fact, he was a good all-round field naturalist.

He was laid to rest in the Churchyard at Harpham, near Driffield, on January 24th. He is survived by his widow and a married daughter.—H.B.B.

[1] *The Yorkshire Post*, January 23rd, 1933.

# NOTES FROM THE ENTOMOLOGICAL MAGAZINES.

W. J. FORDHAM.

The ' Entomologist's Monthly Magazine ' for January, 1933, contains several interesting papers. *Scopaeus gracilipes* Edmonds is added to the British List of Coleoptera (New to Science) on specimens from Bridport (Harwood) and Charmouth (Stott). A description is also given of *Scopaeus sulcicollis* Steph.

W. D. Hincks continues his ' Notes on the Passalidæ ' and there are other articles on exotic insects. A new bug (*Myrmedobia bedwelli* China) is added to the British list from Cornwall and M. D. Austin writes on ' The insect and allied fauna of cultivated mushrooms.' Among the shorter notes are ' Further notes on some British species of *Dolerus*,' by Dr. Perkins, and ' Hemiptera-Heteroptera in Sussex,' by H. R. P. Collett.

In the ' Entomologist's Monthly Magazine,' for February, G. B. Walsh continues his ' Studies in the British Necrophagous Coleoptera,' based on observations made in Raincliffe Woods and on Seamer Moor near Scarborough. H. Donisthorpe describes a new variety of the beetle *Malachius marginellus* (var. *angusti-marginalis*). Lt.-Col. C. G. Nurse contributes a note on *Fidonia limbaria* Fab., a moth with no certain record of its capture outside Suffolk for fifty years. A. M. Altson has an article on Termites and W. P. Curtis discusses ' Meigen's Nouvelle Classification ' of the Diptera. There are several shorter notes of interest.

The ' Entomologist's Record ' for January contains the following articles : ' Erebiidæ and Lycænidæ from Southern Austria,' by F. B. and A. E. Welch ; ' A note on *Lampides* (*Lycæna*) boeticus L.,' by J. S. Taylor ; ' Lepidoptera at Maurin, Basses-Alpes, France,' by A. E. Burras, W. P. Curtis, and W. Fassnidge, and ' Further notes on a Willow Swamp in Windsor Forest,' by H. Donisthorpe, enumerating several Coleoptera taken there.

The ' Entomologist's Record ' for Februàry contains ' Notes on the Psychidæ,' by Rev. C. R. N. Burrows ; ' On recording entomological publications,' by H. Donisthorpe ; ' Notes on Erebiid species,' by B. C. S. Warren, and ' Holiday notes ; Eastbourne District, 1932,' by J. A. Downes and B. J. McNulty. There are several short notes including one on *Eupithecia pusillata* in Northumberland.

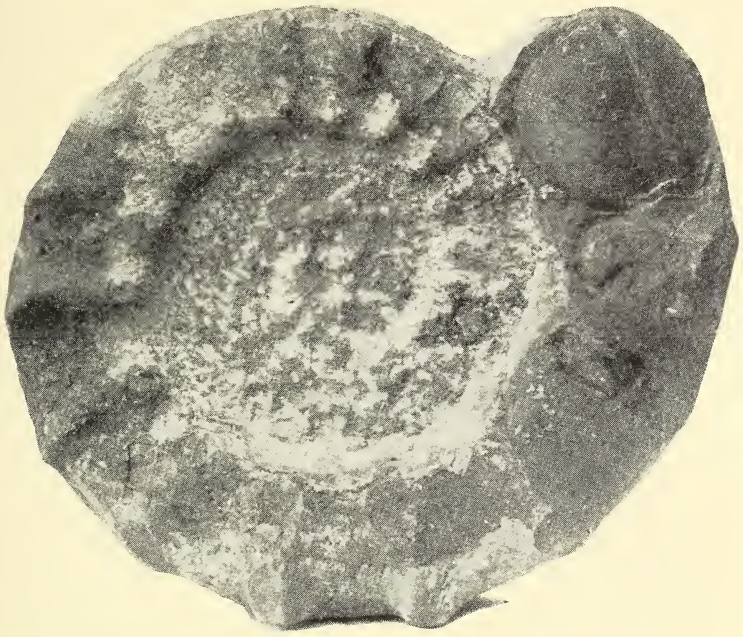
The ' Entomologist ' for January, 1933, contains articles on the life history of *Acosmetia caliginosa* Hb., by Messrs. E. A. Cockayne and C. N. Hawkins, a new Syrian butterfly by Capt. A. F. Hemming ; ' A Summer in Bulgaria after butterflies,' by Brigd.-Gen. C. H. C. van Straubenzee, and ' Two new American species of Siphonaptera,' by Dr. Karl Jordan. Short notes are chiefly concerned with immigration records.

The February number contains ' *Nepticula decentella* H-S. (Lep). ; a species new to Britain,' by R. Adkin ; ' Notes on Arran Lepidoptera,' by G. D. Haggart ; ' A Summer in Bulgaria after Butterflies ' (continued) ; ' The life history of *Acosmetia caliginosa* Hb.' (continued) ; ' Notes on British Odonata in 1931 and 1932,' by J. Cowley, and ' Trichoptera from Oxford,' by M. E. Mosely. There are numerous short notes mainly lepidopterological and a note on a Cecidomyid larva preying on the Psyllid *Aphalara exilis*.

The ' Entomologist ' for March contains the following : ' Collecting notes (Lepidoptera),' by C. G. M. de Worms ; ' The life history of *Acosmetia caliginosa* Hb.,' (concluded) ; ' New Carpenter Bees from South Africa,' by T. D. A. Cockerell ; ' *Faunis* (Lep. Amath.). Revisional List,' by C. J. Brooks and ' A new *Delias* from the Malay Peninsula ' (Lepidoptera ; Pieridæ), by A. S. Corbett. There are numerous short notes.

# THE MALTON MUSEUM AND OTHER GEOLOGICAL COLLECTIONS.

Geologists of forty years ago will remember the magnificent collection of geological specimens got together at Malton by that prince of collectors, Samuel Chadwick. In those days, the Museum at Malton was the rendezvous for geologists and collectors from all over the country, and any London or provincial geological society visiting Yorkshire frequently made Malton the centre, partly for its wealth of palæontological remains,



*Ammonite perarmatum* (?) **Aptychus, Phillips'** *Trigonellites antiquatus* **in position.**

but principally to examine the series of objects collected by Mr. S. Chadwick.

Malton is in the centre of an area among the Coralline Oolite rocks which, at one time, resembled a large reef and the corals can still be seen in the limestone quarries, and among them are myriads of forms of animal life : bivalves, univalves, sea-urchins, belemnites, sponges, and so on. The most interesting of all, however, and a feature for which the area is famous, are the teeth, both palate and incisors, and bones of fish of various families, gigantic saurians or fish lizards, as well as crustaceans of many forms.

In Chadwick's day there were innumerable quarries at Malton, Settrington, North Grimston, Seamer and other areas, and Chadwick, Mortimer, Hudleston, and a whole host of well-known collectors vied with each other in securing specimens from the workmen. Chadwick was perhaps one of the most successful, as his particular business enabled him frequently to visit the various districts.

It must be remembered, however, that in those days quarrying was

carried out by a very different process from what it is to-day. Then, every quarryman saw practically every piece of rock which he dislodged by his pick or crowbar, and if he missed any fossil therein it was probably noticed by the person who placed it in the cart, or broke it up for road metal or lime burning. Each particular fossil had a definite price according to its rarity or condition, and the quarrymen made quite a substantial supplement to their incomes in their zeal for preserving good specimens. In this way the shelves in the Malton Museum, for which Chadwick acted as curator, became loaded with examples from ammonites, three feet or more in diameter, to fish teeth almost microscopic in size.

Speaking of the large ammonites reminds us that there was strong competition between Mortimer and Chadwick as to which could get the largest chalk Ammonite, and each one accused the other of adding a certain amount of plaster of paris at the end of the specimen to make it a few inches larger than that of the competitor, and from subsequent examination it appears that both of them were right !

The chalk collections formed by Chadwick, Mortimer and others can never be replaced as they were obtained from quarries which do not now exist. It will be remembered that years ago, the East Yorkshire roads were largely made of chalk or Oolite, and this was obtained from quarries in the fields on the road sides, usually placed half a mile apart ; thus each one supplied the road for a quarter of a mile on either side. In this way, the hundreds of sections enabled collecting to be carried on in parts of the chalk where there are no sections now, and consequently the specimens can no longer be obtained.

The Malton collection was used by the Geological Survey, by the late W. H. Hudleston, who wrote many valuable monographs on the Mollusca of the Oolitic Rocks ; Sir Archibald Geikie, Professor Watts, and, in fact, most authors of standard textbooks on geology had to refer to the wonderfully prepared specimens in the Malton collection. Chadwick spared no pains and gave considerable time in extracting each specimen from its matrix. He also adopted a very useful method of leaving a certain quantity of the actual rock around the objects, and the back of this was sawn through and then polished flat so as easily to rest on the shelves. Upon this flat portion, in indelible ink, he gave the name of the specimen, the actual quarry and locality in which it was found, and the date. This makes the series extraordinarily valuable from a geological point of view as so many collections of this sort exist without the necessary data to enable the student to take full advantage of the information an object may give. On this point, one well remembers a prominent official of the British Museum when collecting with a party in East Yorkshire, immediately he found a specimen he either wrote upon it or placed a label upon it giving the information as to locality, etc., and his advice to his students was ' The first thing you do is to stick a d—— label on the d—— specimen,' and there is no doubt that the adjectives used assisted in impressing the very desirable information upon those present.

While it is difficult to single out any particular object in the Malton collection, special stress should be made upon the wealth of material relating to the Oolitic reptile and fish fauna. The ammonites are also particularly well preserved and an exceptionally large example of *Ammonite perarmatum* (?) has long been known, as it has the aptychus, Phillips, *Trigonellites antiquatus* still in position.

The present writer, so long as forty years ago, frequently gave addresses to the people of Malton in the Museum lecture hall when there was a prominent and influential local history society, among whom was the late M. B. Slater, one of the greatest authorities on the Mosses. Times, however, have changed ; the Museum became closed, and for quite a large number of years its treasures have been packed away. Recently,

the building has changed hands : the old rooms used for museum and lecture purposes have entirely been transformed in connection with a Masonic Temple, etc., and one large room has been decorated and cased and contains the fine collections of prehistoric, Roman, and Saxon remains, gathered together largely through the work of Dr. J. L. Kirk and Mr. P. Corder. These are principally from the immediate Malton district and should, of course, remain in Malton, and it is pleasing to find that the necessary arrangements have been made for their permanent home to be there.

The geological specimens have been transferred to Hull where a large number of the principal geological collections relating to Yorkshire seem to be concentrated. The series from the chalk, Oolites, Speeton Clays and Drift, formed by the late J. R. Mortimer, which were housed in a special building known as the Mortimer Museum in Driffield, suffered a similar fate to those at Malton, and through the kindness of Colonel G. H. Clarke were purchased and presented to the people of Hull, where a selection of the more interesting specimens can be seen. Oddly enough, the Mortimer Museum at Driffield has been taken over by the Masonic brethren and to-day serves the purpose of a Masonic Temple and meeting place.

One well-known collector of fossils of a quarter of a century or so ago was the late H. C. Drake, of Scarborough, who spent some years in business at Hull. Mr. Drake devoted his holidays and week-ends, and frequently afternoons, in collecting from the various quarries in Yorkshire, particularly in the Scarborough and Whitby neighbourhood, and he also was a well-known purchaser of specimens from the brick clays at Peterborough. In those days, when the clays were worked by hand, gigantic saurians or fish-lizards and other remains were put aside by the workmen, Mr. Drake being the principal purchaser. One ' paddle ' of a saurian which he obtained there was over three feet in length. On account of difficulties in exhibiting his collections, Mr. Drake handed them over to the Hull Museum during his lifetime.

At Peterborough again, collecting will not be possible for the future as the methods of quarrying have been entirely altered ; ' grabs,' which take a slice of the working face from the bottom to the top in thin slices, deposit the load in a truck which is automatically taken to the grinding mill by cable, and in this way, even if a saurian were met with in the quarry, it would be unseen and it would go, a small section at a time, into the grinding mill as truck after truck was filled. This makes collections already existing in museums of altogether exceeding importance, and those who possess skeletons of these old-time denizens of the waters are lucky indeed.

Another well-known Scarborough collector who had reputation all over the country was the late G. Lether. Like Mr. Drake, he had an extraordinary eye for a good specimen, his collections formed the basis of many important geological monographs, and he was employed by all the geological societies visiting North East Yorkshire, not only on account of his guidance, but for the ability with which he could point out interesting specimens enabling the visitors to chisel them out for themselves. His collections are now at Hull.

A collection of entirely unique character was made some years ago by Mr. E. B. Lotherington, of Scarborough, the owner of a large chalk pit at Middleton-on-the-Wolds, which occurs in certain zones of the chalk not exposed elsewhere. In this quarry the fossil sponges are preserved in such a perfect manner by being impregnated with an iron oxide, but perhaps its principal feature lies in the large nautilus-like inocerami (I. ivolutus), some of which were sent to the British Museum as they had nothing like them from any part of the world. Through Mr. Lotherington's kindness, his collection was purchased for the Museum at Hull on reasonable terms.

The late C. Fox-Strangways, who surveyed the Scarborough district, had a private series of geological specimens which were also given to Hull ; as more recently were the extensive collections made by the late F. F. Walton, F.G.S. ; and C. G. Danford, who, for many years lived at Reighton, and made a marvellous collection of Ammonites, and Belemnites from the Speeton Clay. Many of these were new species to science, and with the exception of some of the types which went to the British Museum, the whole of his specimens came to Hull. On leaving Reighton, he went to live at Folkestone, where the beautiful fossils, still with their original pearl-like shell intact, are so famous, and he spent some years collecting from these beds, and these objects joined his others from Speeton.

A little while ago the well-known museum on the harbour side at Whitby was removed to the new building in the Pannett Park and was opened by the Earl of Harewood. In recent years quite a revived interest has been taken in Whitby, and Messrs. Kendall and Sutcliffe have done wonders in making the Museum attractive to the public. On advice, however, they decided to specialize in local features, and the unrivalled series of Ammonites and saurians from the liassic rocks as well as local bygones and specimens relating to the one-time whaling industry, and Cook, the navigator, (who was born near Whitby), are the main points of interest in the Whitby Museum to-day, and deservedly so. As with other museums founded about a century ago, Whitby had a fine set of Oolitic fossils from the Malton and Settringham district, and these, not being of local interest, were purchased by Hull.

The Whitby Collection included a well preserved starfish from the Oolites, which had been looked upon with envious eyes by the present writer since his boyhood. Some of these specimens have recently been figured and described in a Monograph of the *Palaeontographical Society*, Vol. LXXXIV.

Quite apart from this flow of collections into the Third Port, the Hull Museum already possessed a very good geological series, started in the first instance by a selection of specimens from the Kirkdale Cave, given by Frank Buckland. We believe the Kirkdale Cave really started the museums at Whitby, Scarborough, York, and Hull. The last place was fortunate also in as much as William Smith, the father of English geology, and his illustrious nephew, John Phillips, the author of many standard works on geology gave courses of lectures to the members of the Hull Literary and Philosophical Society, and presented large collections of typical Yorkshire fossils, which are still treasured and kept together. The remarkable collection of Liassic and other Ammonites, including many new species, collected from the Yorkshire Drift by Mr. C. Thompson, and a fine series of remains of elephant, rhinoceros, reindeer, and bison, from the Holderness Gravels by Mrs. Dunn, and others are also here.

Interesting sidelights occur in examining these various collections when they accumulate in one centre ! The enthusiasm of collectors in the early days often resulted in important specimens being missed, and we know of complaints having been made on more than one occasion of these losses. On centralising them, it is possible to find out in what way these examples changed hands. Perhaps the most remarkable instance is that in which an enormous vertebra of a shark from the Red Chalk at Speeton became divided. It is probably the largest bone of its kind recorded from that particular deposit, and must represent a shark of extraordinary proportions. Half of this fossil was a treasure in the Mortimer Collection at Driffield and, on purchasing one of the Scarborough collections, the other half of the same bone proved to be there, and it has now been possible to place them together !

T.S.

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At the request of the late Denison Roebuck, I undertook these annual bibliographies, which had previously been prepared for *The Naturalist* by Dr. A. Harker, F.R.S. I find I have prepared this work now for 41 years, and the duty has certainly been a pleasant one, as it has kept me in touch with the current literature, and I have managed to see many publications which otherwise I should have overlooked.

On advice I am relinquishing many pieces of work of this character, and I am pleased to say that in future these bibliographies will be compiled by Dr. H. C. Versey, of the Leeds University, who is the Secretary of the Yorkshire Geological Society.

It may possibly be of interest to record the chief publications which have regularly been examined for the purposes of this list. These are :—

Antiquaries' Journal.
Antiquity.
Colliery Guardian.
Haworth Ramblers' Circulars.
Quarry.
Modern Roadmaking.
Water.
Geological Magazine.
Mineralogical Magazine.
Vasculum.
North Eastern Naturalist.
Naturalist.
Nature.
Man.
British Association Report.
British Association Journal.
British Association Handbook.
Geological Survey Memoirs.
Geography.
Summary of Progress of the Geological Survey.
Annals of Botany.
Yorkshire Naturalists' Union Circulars.
Journal of Ecology.
Advancement of Science.
Science Progress.
Annals and Magazine of Natural History.
New Phytologist.
Hull Museum Publications.
Natural History Magazine.
British Museum Quarterly.
Colliery Engineering.
Geographical Journal.
South Eastern Naturalist.
Northern Naturalist.
North Western Naturalist.
The Lincolnshire Magazine.
Natural History Magazine.

### Proceedings, Transactions, etc., of Societies.

Yorkshire Geological Society.
Hull Geological Society.
Institute of Civil Engineers.
Anthropological Institute.
Geologists' Association.
Institute of Mining Engineers.
Palæontological Society.
Prehistoric Society of East Anglia.
Southport Society of Natural Science.
Royal Society of Edinburgh.
Lincolnshire Naturalists' Union.
Northern Naturalists' Union.
Royal Irish Academy.
Royal Physical Society.
Geological Society of London.
Cumberland and Westmorland Antiquarian and Archæological Society.
Caradoc and Severn Valley Field Club.
South Eastern Union Scientific Societies.
Liverpool Geological Society.

University of Durham Philosophical Society.
Leeds Literary and Philosophical Society.
Leeds University Publications.
Institute of Water Engineers.
Leeds Geological Society.
Thoroton Society ; Notts.
North England Institute, Mining and Mechanical Engineers.
Cumberland and Westmorland Archæological Society.
University of Durham.
Institute of Fuel.
Manchester Literary and Philosophical Society.
Derbyshire Archæological, etc. Society.
Various Government Departments of Research.
Chester and North Wales Archæological, etc. Society.
St. Peter's School Scientific Society.
Yorkshire Philosophical Society.
Yorkshire Archæological Society.
Cardiff Naturalists' Society.
Grantham Public Library and Museum.
East Riding Antiquarian Society.
Manchester Literary and Philosophical Society.

There are, of course, many others which occasionally have papers, and others which have been published abroad.

We are pleased to say that for the first time, so far as our recollection goes, the British Association Report for 1932, has appeared during the same year that the meeting was held. We have been suggesting this for some years, and its publication means a tremendous saving in the way of duplication of entries. Hitherto the various reprints and publications of the Association which have appeared during the meeting, have also had to be recorded in the following year when the Annual Report has appeared. In this way quite a large number of entries have systematically appeared twice year after year, whereas in the future, if it is possible to follow the example of 1932, this duplication will be avoided.

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(*To be continued*).

# VERTEBRATE ZOOLOGY.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the library of the Church Institute, Leeds, on Saturday, February 18th. The sectional meeting was preceded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee.

At the sectional meeting the President, Mr. Rosse Butterfield, paid a tribute to the work of the late Mr. W. H. St. Quintin who, up to a few years ago, took an active part in the work of the section and was deeply interested in all to do with the protection of Wild Birds.

A stuffed specimen of the Musk Rat was exhibited and the steps now being taken to check its spread in this country were described.

The President then gave his address entitled, ' Human Influence on Changes of Vertebrate Fauna ' and stated that the wild life of an area was subject to mutation and that the influence exerted by man, especially in densely populated areas, was very marked. This was specially true in this country when, during the last century, a substantial increase in the human population coincided with the industrial revolution and greatly improved means of communication. During this period many forms of wild life were exterminated while others increased rapidly.

In Yorkshire immense stretches of virgin land have been brought under cultivation and our green fields are now clothed in alien grasses, the majority of our trees have been imported and animals introduced from the Continent have multiplied at the expense of our indigenous species.

These changes commenced when man abandoned his nomadic life, settled into communities and domesticated animals. During the Roman occupation much was done to improve means of communication, but many parts of the country remained isolated until comparatively recent times.

The Normans were fond of the chase and reserved existing forests and planted new ones. The native trees were Oak, Ash, Wych Elm, Alder, Birch, Yew and a few smaller species. In those forests the wolf and boar long survived and though they have gone, parts of the forests still remain. The ancient forests were deciduous in character, but conifers were largely planted in the last century and this had considerable influence on the avifauna.

The agricultural developments of the eighteenth century led to the drainage of swamps, and few natural sheets of water have survived in Yorkshire. The Enclosure Acts, passed in the reign of George III, saw the end of the system of small holdings developed under the feudal system and the introduction of turnips, clover and potatoes brought about further changes.

Prior to the invention of fire-arms the Hen Harrier and Kite could raid the poultry-yard with impunity but the shot gun became an effective weapon early in the nineteenth century and the larger birds of prey were exterminated in many districts. The introduction of the mowing machine also had its effect on the wild life, notably in the case of the Landrail. During this period Starlings, Rooks, Skylarks and some other species greatly increased their numbers, profiting by the cultivation of the land.

The preservation of feathered game upset the natural balance between the smaller birds and the birds of prey, while the fashion for wearing the feathers of birds in hats led to the destruction of certain species. The first Act of Parliament to protect wild birds was passed in 1869 and this was followed by further measures and by much voluntary work in which the Union had participated.

The construction of sewage works and reservoirs, the formation of lakes by subsidence and the use of oil at sea have all had their effects on the wild life and other less understood factors have operated to the advantage of some species and the disadvantage of others.

In conclusion, the lecturer stated that man had brought about great

changes and it was impossible to forecast the future trend. He anticipated some changes for the better in the purification of rivers and the establishing of further sanctuaries.

Mr. H. B. Booth next read a paper entitled ' The Great Crested Grebe Census and Enquiry of 1931 : The Yorkshire Area.' The paper dealt exhaustively with the status of the species in the county and will be of great value to ornithologists in the future. It is reprinted elsewhere in *The Naturalist.*

At the evening meeting, Mr. K. Chislett read a paper entitled ' Recent Birdwork in Lapland and in the English and Dutch Marshes.' The lecturer first showed photographs of the desolate wastes of Lapland interspersed with meres and rising through forest land to snow-covered mountains in the distance. The bird life was thinly scattered over a vast area, but the possibility of discovering a rare species more than compensated for the hard work involved in discovering nests.

The Willow-grouse, Mealy Redbill, Redwing and Fieldface were first dealt with and the lecturer described the finding of a nesting colony of the latter in forests trees growing on a steep slope. Here and elsewhere that beautiful songster and mimic, the Blue-Throated Warbler, was fairly plentiful. In the swampy regions the Broad-Billed and Wood Sandpiper were found and photographed and the lecturer was also so fortunate as to find the nests of the Jack Snipe. In the mountains the Dotterel and Scandinavian Ptarmigan were found.

The lecturer then described his experiences in Holland and showed photographs of the Gargancy Teal, Black-tailed Godwit and Bittern. The latter nest contained two young, one much older than the other. The feeding process of the nest was well illustrated, the beak of the adult being grasped by one of the young birds when a milky fluid was exuded. The adult then regurgitated a large fish, the head of which, having been swallowed first, was partially digested. The young pecked away at the softened parts after which the adult once more swallowed the fish and left the nest. Later she returned and repeated the process, digestion having proceeded further in the interval : this process was repeated a third time. When an eel is caught it generally contrives to coil itself around the neck and to make the plumage slimy, the bird then uses the powder down as a means of cleansing her plumage.

Photographs were shown of the Marsh Harrier nesting in Holland where the species is plentiful, and these were followed by a series taken in Norfolk. Waterhens appeared to be the main article of food at the nest. Montague's Harrier was next described and illustrated by photographs taken on a wide semi-marshy common in Norfolk. The ' pass ' or transference of food from the cock to the hen in flight was described and frogs, larks and plover were brought to the nest. The lecturer was remarkable both for the excellence of the photographs and the rarity of the subjects shown.

Mr. Jefferson read a paper entitled ' A Duncombe Park Avian Quartet,' in which he dealt with the Wood Wren, Nuthatch, Redstart and Pied Flycatcher.

A large number of nests of the Wood Wren were examined before one was found that offered any scope for successful photography and this was built in a small clearing. The birds were very tame and gave the photographer little chance as they dived into the nest, until a leaf was placed over the young, when a photograph was obtained of the hesitant bird. The food was obtained from the leafy foliage of the tree tops and consisted of caterpillars and winged insects.

The Nuthatch appeared to combine the athletic abilities of the Woodpecker, Tree Creeper and Titmice ; it seemed especially at home searching the bark of trees in all possible positions or clinging to the leafy tips of branches when hunting for caterpillars. It does not use the tail as a prop but relies entirely on the grip obtained with its strong

feet. In the winter, it is readily attracted by nuts and sweets which the head keeper provides. On this estate an outhouse sometimes serves as a store for the carcase of cattle and the Nuthatches obtained access through a broken pane of glass. They also feed on berries, those of the Yew being particularly favoured. On various occasions the adults were seen to carry fresh leaves into the nesting cavity.

The Redstart is plentiful in this locality and a series of photographs of this beautiful bird were shown.

The Pied Flycatcher was then described, and it was stated that it differed in its feeding habits from the Spotted Flycatcher in its readiness to descend to the ground in search of insects. Nests were found at various heights from the ground ranging from a few inches to forty feet. The female bird appeared to do most of the feeding, but the cock put in an appearance at once at the first sign of danger.

The lecture was well illustrated and the series of photographs of the Yorkshire Nuthatch are probably unique.

At the conclusion of the meeting a vote of thanks was passed to the lecturer and the lanternist.

## FURTHER NOTES ON YORKSHIRE HYMENOPTERA ACULEATA.

W. J. FORDHAM, M.R.C.S., L.R.C.P., D.P.H.

I HAVE recently received from Dr. R. C. L. Perkins some important observations on the Yorkshire list of Aculeates. These remarks are embodied in the following notes.

*Hedychrum nobile* Scop. There is an old Yorkshire record from Rufforth Wood. 'Old records of this hardly worth considering.' Parasitic on *Cerceris* and often absent where species of this genus are abundant. 'No species of *Cerceris* have been recorded from Yorks. They are all southern species but there is an old record for *C. arenaria* L. from the Cheshire coast where it is said to have been formerly common.' (*Brit. Nat.*, 1892, 90).

*Chrysis pustulosa* Ab. and *ruddii* Shuck. 'may be all right but I should want to see Smith's specimens.'

*Chrysis analis* Spin. (Yarm. T. Meynell.) 'No doubt an Introduction from abroad if correctly identified.'

*Sapyga clavicornis* L. stated in the list to be rare. 'Now all over South of England, Oxford, Cambridge, Sussex, Cornwall, etc.'

*Hypsiceraeus maculatus* F. 'The peculiar habits of this are well known and have been described at length by various foreign authors. The insect oviposits on spiders, the prey of other *Psammocharidae*.'

*Priocnemis pusillus* Sch. (Allerthorpe, Filey, etc.) may be one of several species.

*Psammochares approximatus* Sm. 'might be the allied species I called *cardui*.'

*Astatus stigma* Pz. 'I took this with bug about 35 years ago.'

*Crossocerus anxius* Wesm. Recorded in the list as nesting in bramble stems. 'Have always found this a ground burrowing species especially in vertical cuttings or banks.'

*Psen shuckardi* Wesm. *equestris* F. and *bicolor* F. 'Difficult and Smith was incapable of separating the species.'

*Passaloecus monilicornis* Dhlb. stated in the list to be rare. 'Common wherever I collect in S. and W. England.'

*Hylaeus annularis* Kirb. 'Smith was entirely unreliable on this genus. His own types of the species *varipes* Sm. (*pictipes* Curt.) consisted of two entirely different species.'

*Colletes marginata* Sm. 'Smith's series of this were mostly wrongly named. Also as in the case of *Halictus atricornis* Smith was entirely unable to distinguish the species he had himself first described.'

*Sphecodes reticulatus* Th. is associated with *Halictus prasinus* Sm.

*Sphecodes monilicornis* Kirb. ' *Halictus rubicundus* Chr. is its chief host.'

*Sphecodes divisus* Kirb. Delete *Andrena* as a host.

*Sphecodes ferruginatus* Schr. ' certainly not parasitic on *Halictus rubicundus* Chr. but on species of the *calceatus* group.'

*Halictus fulvicornis* Kirb. ' Smith's *subfasciatus* were a mixture of *freygessneri and rufitarsis.*'

*Halictus nitidiusculus* Kirb. and *minutus* Kirb. ' Very critical. Smith's *minutus* were practically all *nitidiusculus.*'

*Halictus tetrazonius* Kl. ' If correct, Yorks. is an unexpected locality.'

*Halictus rufitarsis* Ztt. ' Smith took this year's before he described *atricornis* as new and when he did describe *atricornis* he mixed *nitidiusculus* in the type set of specimens.'

*Andrena tibialis* Kirb. (Wooley, Smith). ' Improbable, his specimens are wrong.'

*Andrena spinigera* Kirb. is a southern English bee.

*Andrena ovatula* Kirb. and *Nomada lineola* Pz. ' not worth considering without other records.'

*Nomada flavopicta* Kirb. The host is *Cilissa leporina* Pz. not yet on record for Yorks.

*Nomada xanthosticta* Kirb. Smith's *xanthosticta* was *obtusifrons.* The true *xanthosticta* he described as *bridgmanniana,* his *lateralis* was *bucephalae.*

*Epeolus cruciger* Pz. ' Certainly as a rule *cruciger* is on *succincta* and *notatus* on the other species ' (of *Colletes*).

*Anthophora retusa* L. (Wooley, Smith, Pannal, Roebuck). ' Seems unlikely, especially as it always forms great colonies, being gregarious.'

*Anthophora quadrimaculata* Pz. (Leeds, 1816) ' ? ? ?'

*Megachile centuncularis* L. ' Should contain probably *M. versicolor* which occurs in N. England and is the common Irish species.'

*Coelioxys trigonus* Schr. ' No doubt entirely wrong.' The genus *Coelioxys* are all critical species. Smith's *mandibularis* are *acuminata* Nyl.

Yorkshire hymenopterists are greatly indebted to Dr. Perkins for the above critical notes.

## PREY OF SPECIES OF *SCOPEUMA* MG. (*SCATOPHAGA* MG.)

W. J. FORDHAM, M.R.C.S., L.R.C.P., D.P.H.

The following species of *Scopeuma* and their prey have been kindly identified by Messrs. J. E. Collin, F.E.S. and B. M. Hobby, M.A., F.E.S.

*S. stercoraria* L. A female with the Anthomyid *Pegomyia tenera* Ztt. male, Allerthorpe Common, 8/7/27, a rare species.

A male with the Anthomyid *Hydrotaea irritans* Fln. male, Fylinghall, 6/28.

*S. ordinata* Beck. A female with the Anthomyid *Hydrotaea* sp. indet. female, Halton, Leeds, 6/6/26.

A female with the Anthomyid *Pegomyia bicolor* Wd. male, Low Fell, Gateshead, 6/26.

*Scopeuma ordinata* has not been previously recorded for Yorkshire or Durham.

*S. maculipes* Ztt. A female with the Syrphid *Melanostoma scalare* F. male, Low Fell, 17/5/25.

*S. lutaria* F. A female with the Anthomyid *Polietes albolineata* Fln. female, Low Fell, 1927.

A female with the Anthomyid *Pegohylemyia fugax* Mg. male, Low Fell, 24/5/26.

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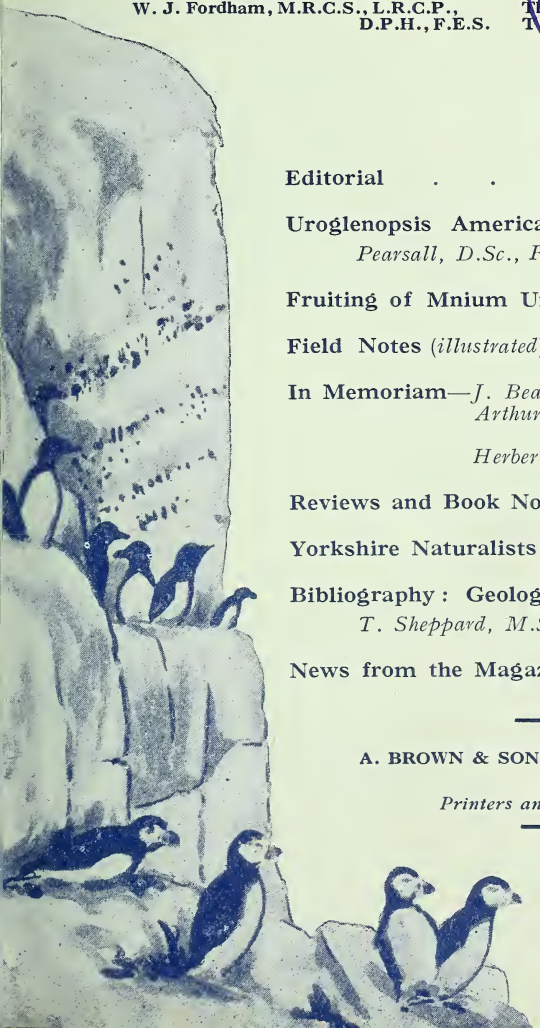

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FOR NOTICES OF YORKSHIRE NATURALISTS' UNION MEETINGS PLEASE SEE PAGE 3 OF COVER.

# EDITORIAL.

The present number of *The Naturalist* is the sixth under the present conditions of publication, and it is now possible to indicate how these conditions will affect the form of the journal. It is clear that the size of *The Naturalist* will be normally limited to twenty-four pages for some time further, and this necessity has involved a modification of policy in order to make the maximum possible use of the available space. The opinion has repeatedly been expressed that the original articles and notes on natural history are the most valuable parts of a journal of this character. Attention has, therefore, been concentrated on maintaining and developing this feature. This has been accomplished partly by printing the book notices and reviews of current literature in smaller type, but also by the omission of editorial articles. These latter will not be resumed unless matters of general interest to readers of *The Naturalist* should arise. By these and other slight modifications it has actually been found possible to increase the proportion of original articles and notes included in our pages. We wish to draw the attention of both readers and of contributors to this aspect of the journal, since it will obviously involve the possibility of publishing a greater number of articles so long as these maintain the requisite standard. A second result of this policy will, however, be the need for further funds to meet the cost of illustrations. Already promises of help have been received, for which we express our indebtedness, and further assistance in this direction will be greatly appreciated. Under these conditions it is hoped to extend the scope of *The Naturalist* somewhat, and contributions dealing with aspects of natural history which are undergoing rapid development will be especially welcomed.

The Rotherham Naturalists' Society held its 53rd Annual Meeting this spring. It is just 50 years since the Society, which is one of the oldest of its kind in the country, joined the Yorkshire Naturalists' Union. We congratulate the Rotherham Naturalists most heartily and are pleased to record that the President of the Society for this year is Mr. Ralph Chislett, M.B.O.U., a review of whose charming bird book appears in this issue.



JUN 10 1933

# UROGLENOPSIS AMERICANA IN WINDERMERE.

W. H. PEARSALL, D.Sc., F.L.S.

In July and August, 1932, the water of Windermere contained very large numbers of an alga which proved on examination to be *Uroglenopsis americana* (Calkins) Lemmerman. The alga was composed of a colourless, gelatinous matrix of spherical shape, on the outside of which were embedded ellipsoidal cells. Each cell was provided with an eye spot and a single golden-brown to olive-brown chromatophore. The latter was plate like or disciform. Globules of an oily nature were present. Protruding through the gelatinous matrix into the outer water from each cell were two cilia of unequal length, the longer about two to three times the length of the cell, the shorter about half the length of the cell or rather less. The cells were about 6—10$\mu$ in length, and the colonies were between 300 and 400$\mu$ in diameter. The plant is excellently figured by G. M. Smith (Wisconsin Phytoplankton, *Wisc. Geol. and Nat. Hist. Survey*, No. 57, 1920).

This species has not been described previously for the British Isles, although it is recorded for Germany. It is not impossible, however, that it has been missed because I found it impossible to preserve it for subsequent examination. Within an hour or two after making a collection almost all the colonies were unrecognisable. The individual cells shoot out from the gelatinous matrix and swim round independently in the external medium for a time before settling down and losing their cilia. In cultures they showed no disposition to form new colonies. The same disorganisation takes place immediately preservatives are added, and none out of a large number of methods of fixing algæ was successful in preserving any of the colonies for more detailed examination.

On account of this peculiarity it is not easy to say whether *Uroglenopsis americana* is a species newly established in Windermere or not. In view of the rapidity with which it disorganises it is quite possible that it may have been present in previous years in smaller numbers and have escaped notice. Most of the earlier collections recorded from this lake were not examined until an hour or two after collection. I feel fairly safe in saying, however, that *Uroglenopsis* could hardly have escaped detection if it had been present in earlier years in the numbers in which it was present in 1932. It was immediately obvious to the naked eye, and the peculiar olive or brownish tinge of the colonies was immediately noticeable, so that even without a microscope it would not have been possible to mistake it for a green or blue-green algæ.

# BRITISH ASSOCIATION
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(FOUNDED 1831 : INCORPORATED BY ROYAL CHARTER 1928)

# ANNUAL MEETING
(103rd YEAR)

# LEICESTER
## September 6th—13th, 1933

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SIR FREDERICK GOWLAND HOPKINS, Pres.R.S.

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|---|---|---|---|
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| | | **H** (*Anthropology*) | **Rt. Hon. Lord Raglan** |
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| **D** (*Zoology*) | **Dr. J. Gray, F.R.S.** | **K** (*Botany*) | **Prof. F. E. Lloyd** |
| **E** (*Geography*) | **Rt. Hon. Lord Meston, K.C.S.I.** | **L** (*Educational Science*) | **J. L. Holland** |
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# BRITISH ASSOCIATION
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## *Leicester Meeting, September 6—13, 1933*

The Presidential Address, by Sir Frederick Gowland Hopkins, will deal with Life in its Chemical Aspects.

Among the principal subjects expected to be dealt with in Sectional Addresses and Discussions are the following:—

Seasonal Weather and its Prediction. The Past History of the Earth. Industrial Physics. Natural Colouring Matters and their Analogues. Hormones. The Chemistry of the Tanning Process. Structures of some British Coal-fields. The Possibility and Desirability of Greatly Increasing the Production of Gold. The Mechanical View of Life. The Growth of Population in the Midlands. Regional Planning. The Gold Standard. Some Experiences in Mechanical Engineering. Noise. What is Tradition? The First Crossing of the Great South Arabian Desert. The Activity of Nerve-cells. Genetics. The Status of Psychology as an Empirical Science. The Development of a National Educational System. The Cultural Value of Science. Chemistry and Agriculture. Land Drainage Problems. Milk, its Handling and Food Value.

The Sections will be in Session severally or jointly throughout the Meeting for the hearing of papers on many other subjects within their various departments.

Evening discourses will be given by Sir JOSIAH STAMP, G.B.E., on a subject in Economic Science, and by Prof. JOCELYN F. THORPE, C.B.E., on 'The Work of the Safety in Mines Research Board.'

Evening Receptions, and Excursions to points of scientific interest, works, etc., in the locality, will be arranged. Provision for the accommodation of visiting Members, etc., is in the hands of a Local Committee.

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In this connection also it is of interest to note that the Windermere plankton has been changing consistently and rapidly during the last twenty years. The changes are, on the whole, in the direction of a greater abundance of blue-green algae, and they indicate a greater amount of organic matter dissolved in the water. Professor Tracey E. Hazen, of Columbia University, informs me that *Uroglenopsis* in the United States is characteristic of highly organic waters. Its appearance in Windermere would thus be quite consistent with the changes which have been observed in that lake, and from these various facts I think it probable that it represents a recent development in Windermere.

## FRUITING OF MNIUM UNDULATUM.

JOHN E. NOWERS.

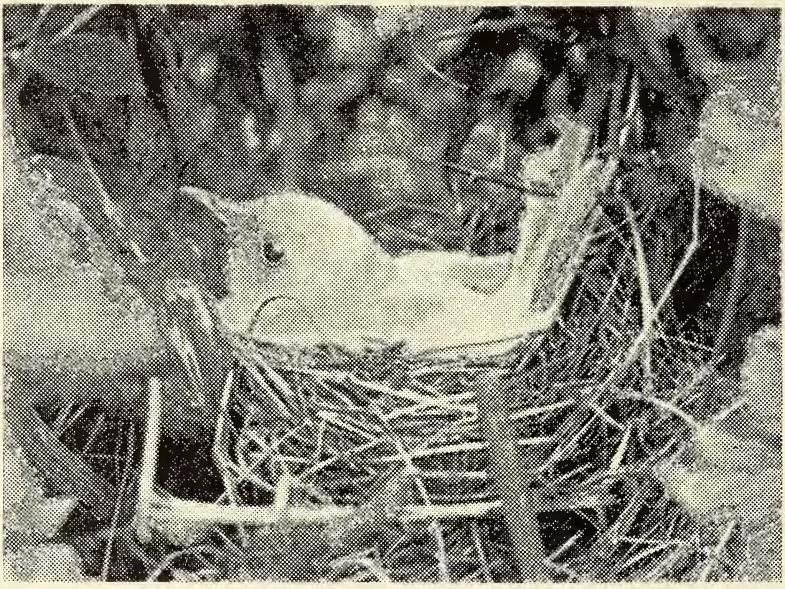
I have read Chris. A. Cheetham's note in March *Naturalist* entitled 'Uncommon Moss Fruits,' with much interest. Another Yorkshire locality where *Mnium undulatum* fruits is Howden Hill Wood, on the Yorkshire bank of the Tees, between Manfield Scar and Piercebridge. There were large numbers of capsules on 14/4/28, also on 16/5/32. I have not been to the spot this year, but it looks to be a place where this moss frequently produces capsules.

## FIELD NOTES.

**Badgers and Lambs.**—Badgers are now more numerous in parts of Cumberland County than they have ever been within living memory. Some of the sheep farmers have always looked upon Brock as a menace to young lambs. In one area of the County where very many badgers have been killed, there have been isolated and very rare cases where a badger was found to have dined off young lamb. But even these very rare cases do not prove that Brock actually killed the lamb. His meat diet is carrion, and he may have found the young lamb dead. Be that as it may, Brock's friends stoutly deny that he will kill young lambs. The whole question has come up again over a happening at a hunt. The Cumberland Farmers' Foxhounds ran a fox to earth. Terriers were put in and they encountered unexpected opposition in the way of a badger, receiving a bad mauling before Brock was drawn out and killed. Then a second badger appeared to meet a like fate, and finally Reynard was got. It was a most unusual though not altogether an unknown thing, to find fox and badger in the same earth. Inside of one of the badgers was found the foot and head of a newly-born lamb, which, although proof of the eating, was again no proof of the killing.—T. F. MARRINER, Carlisle.

**Hen Harrier in Upper Nidderdale.**—On December 9th, 1932, a keeper on his rounds above Middlesmoor, peeping over a wall, observed a large bird feeding upon a partridge. Unfortunately he had his gun with him, with the result that a fine male Hen Harrier was shot.—R. FORTUNE.

**Albino British Song Thrush.**—This most strikingly beautiful bird is incubating her five eggs (early May) in



the Menston district (Wharfedale). Her mate is in normal plumage. We are indebted to the editor of the *Bradford Telegraph and Argus* for the loan of this interesting block.—H. B. BOOTH.

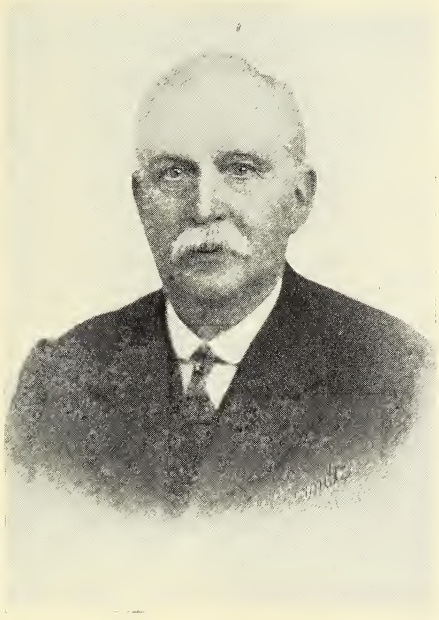
LATER NOTE—Through the good services of Mr. H. Williams, chief reporter to the *Bradford Telegraph and Argus*, I have since been able to visit this interesting bird. She is perfectly white with pink eyes, and a very pale shade of yellow on her beak. She has been about Menston throughout the past winter and has been regularly fed by a lady, at about two to three hundred yards from where she has nested. She is therefore extremely tame, and as my chief object was to obtain the nature of her progeny, we had gently to push her off the nest. I found three almost entirely feathered young birds of the normal colouration and an addled egg. The other egg had been stolen.—H.B.B.

# In Memoriam.

## J. BEANLAND.

On Sunday, September 18th, 1932, occurred the death of Mr. J. Beanland, following upon a sudden heart attack, and students of natural history in the County, especially in the West Riding, deplore his loss.

Known from sheer affection as 'Jo,' Mr. Beanland was associated with the Yorkshire Naturalists' Union for more



than forty years and for many years was a member of the Executive.

Born in Manningham, Bradford, in 1857, he entered the service of the firm of Sir Jacob Behrens at the age of 13, and until his death, 62 years later, he remained in that service, being finally in charge of a pattern-room and having earned the very high regard of his employers.

A great walker and passionately fond of the country he was working with a group of enthusiastic naturalists as far back as 1878.

In 1887 he joined the Bradford Naturalists at the same time as Messrs. H. B. Booth and Fred Rhodes. In this Society

he has been Secretary five times, President twice and for a long time has recorded for Phanerogamic Botany as well as for one or more branches of Invertebrate Zoology. His botanical rambles have taken him to the Continent and to Ireland. (One visit to Paris is said to have consisted very largely of a lengthy stay in the Jardin des Plantes.)

In his Botanical Recordership, dealing with the area assigned to the Bradford Naturalists by the Y.N.U. he showed extreme care. He would spare no pains to make quite sure of the correctness of a record. Even if his honest scepticism with regard to the finding of a rare species in an unlikely place might sometimes ruffle the susceptibility of the finder, it was never a carping scepticism.

He had a great love of truth and an equally great detestation of humbug or sham, and thus his records are of the greatest value.

For a time he did good work in other branches of Natural History and acted as recorder in several of them. For instance, fresh-water mollusca, beetles, lepidoptera and especially dragon-flies received his careful and discriminating attention.

He had a good eye for the relative values of specific details and a remarkable memory, especially in connection with plants. Recorders in other branches were often indebted to him for records of interesting and uncommon species of which he had realised the interest and rarity. His very accurate sense of topography enabled him to describe the exact location of a plant so well that any one following his directions carefully could be sure of finding it—no mean feat of description !

He scrupulously safeguarded the localities for the great rarities and maintained a very discreet reticence with regard to them.

As a member of Mr. West's classes he came much under the influence of the celebrated Bradford botanist and, needless to say, his enthusiasm was stimulated immensely by the friendship that resulted.

Some thirty years ago the Saltaire and Baildon side of Bradford had a very energetic group of entomological workers, and ' Jo ' Beanland was among them. For years he cycled to Grassington once a month for a visit to Grass Woods in the course of his investigations into the insect life of the locality.

The Bradford Naturalists have accepted the care of his collections, which is a very good thing indeed, for such a complete series of authenticated specimens collected locally is unlikely to be obtainable again in the district.

His experience was always available during the publication of the Bradford Scientific Journal, and he was a valued member of the Advisory Committee for the Bradford Botanical

Garden, of whose original twelve members only four remain.

Some three years ago Mrs. Beanland died, but his brother and sister and two married daughters survive him.

Always helpful to others, his appearance at the meetings of the Societies with which he was associated was always marked by his having something of interest to show and some interesting observations to report.

He was very hopeful when in the early years of this century there was such a boom in Nature Study in the Schools, for he hoped it would lead to a large increase in the number of Field Naturalists.

Genial, kindly, a real nature-lover, and withal a sound botanist and entomologist, he was a mine of information on field work in the county area allotted to Bradford for study. Botanists of his type have laid those sound foundations upon which much of the superstructure of Ecology has been built. It has often been remarked that Mr. West was an ecologist before the ' subject ' was officially recognised, and the same might be well said of Mr. Beanland. All who knew ' Jo ' Beanland will miss him much.

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## ARTHUR RUFUS SANDERSON, F.L.S.

The year 1932 laid a heavy hand on Yorkshire botanists and the loss of J. Beanland, H. H. Sturdy and A. R. Sanderson in a few short months will long be felt at such times as we should have instinctively turned to them for help and guidance.

Sanderson and Beanland were both keen members of the Bradford Society and both owed a great debt to William West like so many other past and present members of this Society. They were both naturalists in the widest sense, pre-eminently botanists, but also workers in other branches, particularly Entomology. Sanderson was always far more interested in field work, collecting or investigating, than he was in recording his work. He was always delighted to have others with him in the field, and many of the school children who were privileged to attend school rambles with him or those older people who attended the evening classes, followed by summer field work that he conducted at Dewsbury will long recall the interest he aroused amongst them.

A paper he published in this magazine in 1916 on *Brefeldia maxima* will serve to show the thoroughness of his work. He had a mass of plasmodium of this species under observation for thirty hours, taking portions and fixing them every fifteen minutes from eighteen hours onwards. He published an instructive and useful list of the Mycetozoa of the Austwick

district in *The Naturalist*, 1918, pp. 62-65 ; another paper on the Fairyfly, *Polynema natans*, *The Naturalist*, 1916, 346-7, shows his interest in the life histories of the insect world.

On his trips to the West Coast of Ireland during vacations he worked keenly at the marine plants and animals, especially the zoophytes, and the pages of the *Irish Naturalist* give some glimpses of his work in this field.

In 1918 the offer of a post in the Research Laboratory of the Rubber Growers' Association at Petaling, F.M.S., gave him a long desired opportunity to see the fauna and flora of the tropics, as well as work of a congenial nature, and his success in this post is seen in the yearly reports of the work done in the laboratory.

Botanically his interest seems still to have been mostly in the Mycetozoa, and he published along list of Malayan species. When on leave he generally made his way to the hill top stations which seemed to offer the most hopeful places for new insects. He collected a great amount of material, and had settled down at Austwick near his native district hoping to work out his collections, but this was not to be and his sudden death on Christmas Day leaves this to other hands.—C. A. C.

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## HERBERT HASTINGS STURDY.

Botanists from outside Yorkshire knew Sturdy better than those living in the County away from the Settle area. Settle may be looked on as the headquarter for the limestone area of Yorkshire ; here visitors with botanical interests were always directed to Sturdy, and they found him a man with an intense love of the wild plants of the district, one whose greatest delight in life was to show a plant lover the flowers and ferns of his native district, to go out with him was a pleasure such visitors were always anxious to repeat and also to tell to others who were likely to profit from his kindness. In this way he built up a widespread circle of friends. At Settle and in the surrounding neighbourhood his reputation was well known and his help was sought by all, but he was far too diffident to take a hand in the Union's activities, looking on the members as far too scientific for him to associate with ; this may have been due to the fact that practically the whole of his botanical knowledge was self taught. Sturdy had no William West to help and guide him, he learnt from his father, who was a gardener, that plants had a double Latin name, and a list of plants of the limestone area at Buxton seems for long to have been his only text book. To those who have

the advantage of University or City life with access to libraries and contact with other workers in special subjects, the disadvantages under which Sturdy started must be very evident. Later on, Dr. Watts' School flora became available to him, but at that time there was little or no contact between the School at Giggleswick and the working folk of Settle. Sturdy and his friend, R. Wilson, had to plod slowly on their way, and they have shown what is possible for isolated individuals by steady effort.

One thing he will be remembered for is his discovery of plants of the Holly fern in this district at a time when botanical members of this Union were of opinion that this had long been lost to the County. Officially plants are sometimes recorded as ' now gone ' when local workers such as Sturdy have known them all along, and it behoves us to try and extend the Union's activities into the county districts as widely as possible.—C. A. C.

## REVIEWS AND BOOK NOTICES.

**Plant Ecology,** by **W. Leach** (Methuen & Co., Ltd., *monographs on Biological Subjects,* 3/6). This little book is a useful outline of modern ecological methods. It gives in convenient form the principles upon which ecological work must be based and the methods to be employed in studying ecological relationships in the field. The soil factors in particular are treated in some detail, a treatment warranted by their importance in this country.

**The Senses of Insects,** by **H. Eltringham, M.A., D.Sc., F.R.S.,** pp. viii.+126 and 25 figures in the text. (Methuen & Co., Ltd., *Monographs on Biological Subjects,* 3/6. This excellent monograph will be welcomed by all entomologists and by naturalists generally. A surprising amount of up-to-date information is contained in small compass and the text is supplemented by upwards of 150 references to the literature of the subject.

**First Book of Biology,** by **M. E. Phillips and L. E. Cox** (University of London Press). As the title implies, this is an elementary text book. In it, the attempt has been made successfully to start nature study and biology from sources of material which are for the most part familiar to all, whether they live in the town or in the country. The illustrations are well chosen and the text clear and adequate.

**Salmon and Sea Trout Smolts in the Tees. The Ministry of Agriculture and Fisheries** have issued as No. 4, of Vol. III of their **Fishery Investigations** (H.M. Stationery Office, price 9d., postage extra), two papers by **F. T. K. Pentelow, B. A. Southgate** and **R. Bassindale,** dealing with Smolts in the Tees Estuary. Apparently the Smolts only migrate when they reach a certain definite size. Slow growing smolts are therefore older at the time of migration. The smolts include a much larger proportion of females than of males. The female : male ratio is 1.93 for sea trout and 2.77 for salmon.

Included in **The New Phytologist** for March (Vol. XXXII, No. 1) are papers on the ephemeral flowers of *Turnera ulmifolia* by **N. G. Ball,** and on the rôle of organic acids in plant metabolism by **T. A. Bennet-Clark.** The flowers of *Turnera* open just after sunrise and close three or four hours later. Darkness and humidity have little effect on their opening time, but if they are illuminated overnight—opening is prevented for several days. Another paper by N. Gill deals with the relation

between flowering and cambial activity in *Populus* and *Salix* spp., cambial activity is found below the developing catkins, and dry weight increase of the catkins is observed in Hazel and Alder. There is no increase in dry weight in the developing catkin, and no cambial activity is found below them.

**Northward Ho! for Birds,** by **Ralph Chislett, M.B.O.U., F.R.P.S.** Country Life, Ltd., pp. xvi+188, 15/- net. North Country naturalists should be very proud of Mr. Chislett for the making of this wonderful book. Nowadays there are many good nature photographers, many first-rate naturalists, and not a few people can write pleasing and accurate English, but it is very rare to find marked ability in all three spheres combined in one man. No one will read Mr. Chislett's book without feeling that they are observing in the company of a skilled specialist whose powers of observation are appropriately matched by his lucid descriptions of the subjects of his prolonged study. Verbal pictures of actual sections of the countrysides visited, and of the bird life in general which inhabits them, are accompanied by intimate details of the home life of many rarities ; and the surrounding plant life is not forgotten. The book can be considered as a record of the bird life of northern moorland, from northern England, Scotland and Shetland to far Lapland, with three chapters on the birds of a Baltic island, and a final one on methods in the field and after as make-weights. Mr. Chislett's photographs are well known to Yorkshire naturalists. His real love of birds, happily combined with rare patience and skill, have enabled him to make perfectly natural pictures. In this book there are reproduced no less than 87 fine photographs of 51 species, among those dealt with being the Whimbrel, Greenshank, Crested Tit, White Wagtail, Red-spotted Bluethroat, Wood Sandpiper and Dotterel. The reproduction of the photographs are in photogravure and are as good as anything of the kind yet printed in this country. The publishers merit a special word of congratulation for the way in which they have brought out this book.

**Monograph and Iconograph of the Native British Orchidaceae,** by **Col. M. J. Godfery.** Cambridge University Press, xvi.+259 pp. and 57 coloured plates, £7/7/-. Of late years many botanists have been attracted to the taxonomic problems presented by the almost limitless variation of the common British orchids. Workers in this field will welcome the publication of Colonel Godfery's monograph, which embodies the results of a long experience of the problems involved and of exhaustive enquiries in this country and on the continent. Though the vast amount of material embodied in the resulting volume will take a considerable time to assimilate and collate, it may be anticipated that this book will rank as the authoritative work on British orchids in general and on the status of many of our doubtful British forms. To the general botanist, the excellent chapters dealing with the structure and biology of orchids and of their flowers will undoubtedly appeal strongly. Possibly there may be some disappointment with the author's decision to rank *O. O'Kellyi* merely as a form of *O. maculata*. In the North of England there are certainly many who regard *O. O'Kellyi* as distinct not only in its flower form but also in its ecological range. It must be admitted, however, that the treatment of the more variable orchids is quite consistent, and the wide experience of the author compels us to respect his conclusions. A new form of orchid for north country botanists is described for the first time. It is *O. latifolia* var. *eborensis*. It was found growing in a compact group near Helmsley and has since been discovered in Durham. The work is profusely illustrated and the illustrations are excellent, giving as they do the essential diagnostic characters. The publishers must have had a hard task in attempting to rival the beauty of Mrs. Godfery's original water colour drawings, but, on the whole, they have been very successful.

# YORKSHIRE NATURALISTS AT ROBIN HOOD'S BAY.

With Robin Hood's Bay as the centre for exploring this section of the N.E. Division, well-attended excursions of the Yorkshire Naturalists' Union justified a reversion to the former practice of holding a meeting during Easter week-end. Falling rather late (April 15th to 17th), as Easter did this year, the countryside had already become sufficiently attractive to keep ornithologists, entomologists and botanists busy ; although very little was seen of the sun during that week-end the weather was fine enough to permit of the whole of the programme being carried out under favourable conditions.

The route for Saturday's excursion, *via* Fyling Hall, was chosen more particularly for the investigation of Ramsdale Beck up to Ramsdale Mill ; the woods just above the mill bore evidence of having been earlier carpeted with daffodils, and this charming part of the dale also received attention. In the afternoon the party proceeded to Foulsike, where the Bog Myrtle marshes proved full of interest for the botanists and entomologists. The Bog Myrtle is still gathered by local inhabitants for making 'Gale Beer,' a beverage for the preparation of which recipes have been handed down for hundreds of years. From such information as could be gleaned locally its preparation is simple ; a sugar solution containing lemon juice is fermented with baker's yeast, a few sprigs of the Gale being introduced merely for flavouring purposes.

Easter Monday was a popular day, and the party staying at headquarters was augmented by a large contingent of Scarborough Naturalists, the field being led by Mr. E. B. Lotherington, whose familiarity with the district is a great asset on any excursion in that area. Stoupe Beck, Stoupe Brow, the old Alum Works and Howdale Beck were in turn examined during the day, and many interesting observations are recorded in the reports which follow. No fewer than sixty members and associates took part in this excursion.

On Monday evening a meeting was held at Headquarters, at which the President (Mr. J. M. Brown, B.Sc., F.L.S.) presided. Reports on the work of the Sections were presented by the President, Messrs. C. D. Bingham, W. F. Fearnley, J. L. Illingworth, E. B. Lotherington, F. A. Mason, — Thorpe-Catton, W. P. Winter, A. B. Ward, Miss D. Hilary, Mrs. E. M. Morehouse, and Miss M. Pilling. The Marine Biology Laboratory of the Leeds University was used by some of the members during the week-end, and the reports of Messrs. Bingham and Thorpe-Catton on marine botany and zoology respectively, made a very valuable contribution to the interest and success of the meeting.

Cordial thanks were accorded to the Local Secretary (Mr. G. B. Walsh, B.Sc.) and to the leaders of excursions, Miss Lush, and Mr. E. B. Lotherington.—F.A.M.

Vertebrate Zoology (W. F. Fearnley) :—The skull of a Badger was picked up by Mr. Bingham. Traces of a Fox were found near Fylingdales Station in the shape of a recently decapitated and partially devoured fowl. A Hare and many Rabbits were seen, and Molehills were abundant in places. Mr. J. M. Brown saw a Water Shrew.

Mr. Lotherington pointed out several Adders, and drew attention to their definitely brighter colours during the breeding season, not entirely due to the casting of their skins. Slow Worms were found on the railway embankment at Fylingdales.

Mr. Asquith Wood reported Carrion Crow, Rook, Jackdaw, Magpie, Jay, Song Thrush, Blackbird, Robin, Wren, Hedge Sparrow, Willow Wren, Pied Wagtail, Meadow Pipit, Blue Tit, Great Tit, Skylark, Yellow Bunting, Chaffinch, House Sparrow, Greenfinch, Rock Dove, Curlew, Lapwing, Cormorant, Starling, Herring Gull, Blackheaded Gull, and Lesser Blackbacked Gull.

Mr. J. M. Brown saw Wheatear, Kestrel and Snipe.

A Hooded Crow was seen near Hawsker, Carrion Crows were nesting in Oxbank Wood, and a small rookery of five nests at Thorpe contained young on April 18th. Nests of the Blackbird, Mistle Thrush and Song Thrush were seen, the latter containing young birds. A Cuckoo was seen (April 17th) near the Alum Quarry in How Dale. In the Alum Quarry at Sleights many Jackdaws were nesting, and also a pair of Stockdoves. An Owl was disturbed hiding under the heather in the base of this quarry. A few members who visited Miss Lucas' garden at Raw saw the unusual spectacle of a House Sparrow's untidy nest built in the top of a hawthorn tree.

Other birds noted during the meeting were Linnet, Bullfinch, Rock Pipit, Tawny Owl, Grouse and Pheasant.

Entomology (J. M. Brown) :—Notwithstanding the warm, sunny weather of the preceding fortnight, insects were not at all conspicuous during the week-end. Very few butterflies were seen on the wing, and these included only the very common *Pieris napi* L. and *Vanessa urticae* L. A few early humble-bees, probably *Bombus terrestris* L. and *B. lapidarius* L., were observed seeking out nesting sites, and beetles were not plentiful, but included *Cicindela campestris* L. and *Byrrhus pilula* L. hidden beneath stones in the alum quarry, *Cychrus rostratus* L. by Little Beck, *Bembidion nitidulus* Mm. and *Agonum ruficornis* Gz. fairly plentiful by the various becks. The only mayfly noticed was the subimago of *Bætis rhodani* Pict. by Little Beck. Several species of Stone-fly were taken by the different becks, namely :—

*Perlodes mortoni* Klap., near Falling Foss.
*Tæniopteryx risi* Mort., in Fylingdales.
*Protonemura meyeri* Pict.
*P. precox* Mort., in Fylingdales.
*Nemoura cambrica* Mort.
*Leuctra hippopus* Kmpy.
*L. inermis* Kmpy.

and the very local Yorkshire species, *Capnia vidua* Klp. in Howdale and by Little Beck (below Falling Foss), thus adding a new V.C. (62) for the species.

Very few Hemiptera were seen apart from the aquatic and semi-aquatic species. *Acanthia* (*Salda*) *saltatoria* L., *A. C-album* Fieb., *Gerris Gibbifer* Schum. and *Velia currens* F. occurred fairly commonly, and a single specimen of the Psyllid, *Psylla melanoneura* Forst. was obtained.

A considerable number of Collembola were collected, mostly in the alum quarry, in a situation where food would appear to be of the scantiest, viz. under stones on the loose talus slopes of shale. These included

*Onychiurus armatus* (Tullb.).
*Pseudisotoma sensibilis* (Tullb.).
*Isotoma viridis* (Bourl.).
*Isotomurus palustris* (Müll.).
*Entomobrya nivalis* L.
*E. nicoleti* (Lubb.).
*E. multifasciata* (Tullb.).
*Tomocerus minor* (Lubb.).
*Orchesella cincta* (L.).

and *O. litoralis* Brown, a local Yorkshire species, first described from specimens taken at Runswick Bay (*Ann. and Mag. Nat. Hist.*, 1925, p. 155).

*Anurida maritima* (Laboulb.) was plentiful in rock pools on the shore.

The Thysanuran, *Campodea staphylinus* Westw. was fairly plentiful, and a Rock-jumper, probably *Petrobius carpentari* (Bagn.) was reported as occurring on the rocks.

Diptera (Chris. A. Cheetham) :—Inland, flies were scarce, a female

*Tipula lateralis* was handed to me, but no others were noted. The winter midge, *Trichocera regelationis* was about and a cloud of small midges, *Spaniotoma* (*Limnophyes*) *minima* Mg. danced in a sheltered corner at the stream head. Under a stone amongst a nest of Ants I got a single *Bibio laniger* Mg.

A little sunshine brought out a good many flies on the sea shore about heaps of old Laminarias. *Fucellia fucorum* Fall. was plentiful, with an odd female *F. maritima*. *Coelopa* (*Fucomyia*) *frigida* Fln. in a great variety of size, and a lot of the small *Limosina zosteræ* Hal. I am indebted to Dr. F. W. Edwards for the name of the midge and the Bibio, the latter being abnormal, having the thoracic hairs dark and a thinner hind metatarsus than usual.

Conchology (Mrs. E. M. Morehouse) :—During the Easter Meeting rather more attention was devoted to the marine molluscs than the land, the names may appear unfamiliar for our marine species, but the Conchological Society of Great Britain and Ireland have approved of a new list compiled by Mr. R. Winckworth, M.A., which is a monument of patience on the part of the author and has meant many hours of hard work. The most interesting ' finds ' included two slugs, three molluscs of the *Patellidæ* and *Turtonia minuta*, a very small bivalve taken on the underside of stones at low water mark, while *L. saxatilis* was found in quite a new surrounding for them, on stones under *Fuscus versiculosus* and *F. platycarpus*, this species one looks for on boulders, etc., at high water level. Mr. R. Winckworth very kindly verified the two latter species. *Patina pellucida* seemed rather rare, there ought to have been plenty on the Laminarian weed, further south to Scarborough it is fairly common.

*Lepidochiton cinereus* (L.).
*Patella vulgata* (L.).
*Patina pellucida* (Leach).
*Patelloida tessulata* (Müll.) [Acmeæ].
*P. virginea* (Müll.) [Acmeæ].
*Margarites helicinus* (Fab.).
*Gibbula cineraria* (L.).
*G. umbilicalis* (da C.).
*Lacuna vincta* (Montagu).
*L. pallidula* (da C.).
*Rissoa parva* (da C.).
*Littorina littorea* (L.).
*L. saxatilis* (Olivi.) [*L. rudis*].
*L. littoralis* (L.) [*L. obtusata*].
*Nucella lapillus* (L.).
*Tethys punctata* (Cuv.) [Aplysia].
*Æolidea papillosa* (L.).
*Anomia ephippium* (*L.*).
*Mytilus edulis* (L.).
*Kellia suborbicularis* (Montagu).
*Turtonia minuta* (Fab.).
*Cardium edule* (L.).
*Paphia pullastra* (Montagu).
*Mya truncata* (L.).
*Hiatella gallicana* (Lam.) [*S. rugosa*].
*Zirfaea crispata* Gray.

The land species are as follows :—

*Arion ater* (L.).
*A. subfuscus* (Drap.).
*Agriolimax agrestis* (L.).
,, ,, v. *pallida* (Schrenk.).
,, ,, v. *pallida*, s.v. *atritentaculata* (Dum. & Mort.).
,, ,, v. *reticulata* (Moquin-Landon).

*Arianta arbustorum* (L.).
*Helix nemoralis* (L.).
*H. hortensis* (Müll.).
*Jaminea cylindracea* (da C.).
*Vitrea puta* (Alder.).
*V. alliaria* (Miller).
*Ancylus fluviatilis* (Müll.).
*Pisidium cinereum* (Alder.)? malformed.

Freshwater Biology (J. M. Brown) :—Several becks were examined more or less casually in passing, and these were found to vary very considerably in the richness of their animal inhabitants. Howdale Beck was noticeably the poorest, and its paucity was probably to be associated with the scarcity of mosses and other larger forms of vegetation on the submerged stones, but curiously this beck yielded the most interesting of the stone-flies obtained, viz. *Capnia vidua* Klp., a curious species with remarkably short-winged males. Both sexes were later taken by Little Beck. No *Ancylus*, *Gammarus* or *Planarians* were noticed in Howdale Beck.

Row Pasture Beck (Maw Wyke), Ramsdale Beck, and Stoupe Beck (Fylingdales) appeared to be similar to each other in their animal life, and showed the types usually associated with streams of this nature. On the more stable stones a considerable growth of *Cladophora* was noted, while aquatic mosses were more plentiful. The insect larvæ included species of the Caddisflies *Agapetus*, *Rhyacophila* (with pupæ), *Plectrocnemia*, *Hydroptila* (in Row Pasture Beck), and various *Limnophilids*. In Ramsdale Beck the larva of *Diplectrona felix* occurred. Stone-fly larvæ, *Chloroperla grammatica*, *Nemoura* sp. and *Leuctra* sp. were present in all these becks, while by Little Beck cast cuticles of *Perlodes mortoni* were plentiful, by Ramsdale Beck those of *Tæniopteryx risi* occurred on the bordering stones, while the fly of this last species was emerging in numbers along with those of *Protonemura meyeri* and of *P. precox* from Stoupe Beck.

Larvæ of the Mayfly *Heptagenia lateralis* were common in Row Pasture Beck, while those of *Bætis* sp. and *Ecdyonurus* sp. abounded. Planarians were represented by *Polycelis cornuta* in Row Pasture Beck, and by *Planaria alpina* in Ramsdale Beck. *Gammarus*, *Ancylus*, the beetle *Elmis*, with *Velia currens* on the surface in backwaters, were plentiful. Dipterous larvæ were represented by *Simulium* (with pupæ), *Dixa*, and tube-forming *Orthocladids*. Larvæ of *Pedicia rivosa* occurred in Ramsdale Beck, and that of *Tipula gigantea* in Little Beck.

In Row Pasture Beck the Water-shrew (*Neomys fodiens*) was observed for some time, making short excursions from under the banks, and ' nosing ' about in the sediment, probably for larvæ.

A quantity of *Sphagnum* was collected from Brow Moor, at the head of Howdale, and examined for Rhizopoda, and the following (typically *sphagnum* species) were identified :—

*Arcella vulgaris* Ehr.
*Centropyxis aculeata* (Ehr.).
*Cryptodifflugia oviformis* Pen.
*Difflugia oblonga* Ehr.
*Hyalosphenia papilio* Leidy.
*Nebela collaris* (Ehr.).
*N. tincta* (Leidy.).
*N. militaris* Pen.
*Nebela flabellulum* Leidy.
*Heleopera petricola* Leidy.
*Euglypha strigosa* (Ehr.).
*Assulina seminulum* (Ehr.).
*Trinema enchelys* (Ehr.).
*T. linearis* Pen.
*Corythion dubium* Taranek.
*Amphitrema flavum* (Archer).

together with the Tardigrade, *Macrobiotus hufelandi* Sch., and numerous Bdelloid Rotifers.

Botany : Flowering Plants (Chris. A. Cheetham) :—The flowers were well ahead of those in the Settle area ; this was noticeable in Goldilocks (*R. auricomus*) and Milkmaids (*C. pratensis*). The

Primroses in the higher parts of the ghylls made a fine show and accentuated the relative scarcity nearer the town, where one saw them being eagerly gathered and even the plants dug up. A very noticeable absentee was found in the Cowslip, as the clayey soil seemed very suitable for it. The Wood Anemone provided a snowlike carpet in many places and the opposite leaved Chrysosplenium clothed the damper spots with a few scattered lots of the alternative leaved species.

Mosses and Hepatics (Chris. A. Cheetham) :—Amongst the Mosses *Tetraphis Browniana* was the most interesting. It was first seen near Ramsdale Mill and its habit of growing on the underside of the rocks was seen particularly well far inside the low shaft in the Alum quarry. Here, on the clay bottom, *Pellia* fruits inclined almost to a 30-deg. angle in an endeavour to reach the light at the entrance, but the Moss fruits stood out at right angles to the flat roof and showed not the slightest inclination towards the light. By the Mill *Heterocladium heteropterum* and *Pterogophyllum lucens* occurred on damp rocks, the latter in a rather unusual habitat—the vertical face of the rock. There was a good deal of *Dicranella varia* on the clay banks and a little *Dichodontium pellucidum* in the stream bed, but the almost complete absence of mosses or hepatics in the streams seems to need some explanation. It might be suggested that it is due to the roughness of the flood torrent, but higher up, where this effect was less evident, the same scarcity was seen. At the stream head a little *Hyocomium flagellare* was found and also some *Funaria ericetorum*. In some peaty water a growth of *Dicranella squarrosa* was seen which, with the exception of an eighth of an inch of new growth, was quite black. *Hypnum revolvens* was also black in this place. The Dicranella was its usual bright yellow-green in more marshy places. A little *Blindia acuta* was also seen at this spot. At Foulsyke *Hypnum cuspidatum* was in fine fruit, and a good sheet of *Mnium subglobosum* was found. On the banks near the stream mouth at Mill ghyll, *Barbula spadicea* was plentiful with occasional patches of *Trichostomum crispulum*.

Marine Algæ (C. D. Bingham) :—By far the commonest alga on the Robin Hood's Bay reefs is *Corallina officinalis*. This calcareous ' red ' is seen encrusting the floor and sides of all the rock pools except the very highest which are liable to fresh water contamination or to drying up.

The general zonation of the shore is more or less preserved although it is complicated by the general upward slope of the slates towards the sea and the sudden steep reef edges. Several of the important ' browns ' are entirely absent (*e.g. Pelvetia*). The useful zoning types are *Enteromorpha intestinalis* (top), *Ascophyllum nodosum*, *Fucus vesiculosus*, and *Fucus platycarpus* (lower), *Fucus serratus* (normal low tide), *Laminaria digitata* and *Laminaria saccharina* (low spring tides).

As well as these, which are all very prolific, the following are commonly found mixed in the various zones. *Ulva lactuca*, *Cladophora* spp., *Pylaiella littoralis*, *Chondrus crispus*, and *Ceramium* sp., usually in the upper zones but spreading downwards.

*Polysiphonia fastigeata*, epiphytic on *Ascophyllum*, *Halidrys siliquosa*, *Ahnfeltdia*, *Polysiphonia* spp. *Rhodocorton* sp., *Furcellaria fastigiata*, *Polyides rotundus?* all mainly in pools in the *F. serratus* zone.

On the *Laminaria* reefs *Laurentia* and *Himanthalia lorea* are dominant. On the *Laminarias*, *Rhodymenia palmata* is most prolific while *Rhodymenia ciliata*, several *Delesserias*, *Plocamium coccineum*, *Ptilota plumosa*, and *Lomentaria articulata* were found washed up. The sea weeds at Robin Hood's Bay, particularly the ' reds,' are more stunted and less frequent than at Port Erin and district. This is probably due to colder sea and less protection from waves.

Fungi (F. A. Mason) :—Owing to the advanced condition of the vegetation, many species of parasitic fungi were in evidence. Flowers of the Red Campion were found with anthers heavily infected by the smut, *Ustilago violacea*. Small plants of the Barren Strawberry consisting of only a few young leaves were seen covered almost entirely with the caeomata of *Phragmidium Fragariastri*. On Blackberry, *Phr. violaceum* occurred on last year's leaves, while the aecidial stage of the same species was fairly common on the shoots and stems. Among other Uredines collected were :—

*Uromyces Ficariae* and *U. Poae*, on *R. Ficaria*.
*U. Dactylidis* on *Ranunculus repens*.
*Puccinia Leontodontis* on *L. autumnalis*.
*P. variabilis* on *Taraxacum officinale*.
*P. Menthae* on *M. aquatica*.
*P. Primulae* on *P. vulgaris*.
*P. Violae* on *V. Riviniana*.
*P. obscura* on *Bellis perennis*.
*P. oblongata* on *Luzula maxima*.
*P. holcina* on *Holcus mollis*.
*Melampsora Euphorbiae* on *Euphorbia* sp.

Several parasitic species belonging to the phycomycetous genus, Peronospora, were seen, including *P. calotheca* on *Asperula odorata*, *P. Chrysosplenii* on *C. oppositifolium* and *P. Lamii* on *Lamium*, and on *Mentha*.

The powdery mildew of the Hawthorn, *Podosphaera leucotricha* was observed in its conidial stage, (*Oidium farinosum*), already destroying the young shoots in the hedgerows.

The Discomycetes collected were mostly common species and only two or three need be mentioned. *Mollisia atrofusca* occurred on dead herbaceous stems, and *Sclerotinia tuberosa* on the roots of the Anemone ; a fine gathering of *Otidea coccinea* was made by Mr. J. L. Illingworth, in the wood-bottom at Fylingdales. Among the more minute species, *Coccommces dentatus* Sacc., was found on fallen Oak leaves.

The Bog Myrtle and the ground vegetation of the marshes at Foulsike provided abundant material for mycological study, and fine examples of the root-nodules of Myrica Gale were obtained. These nodules, sometimes listed as ' galls,' are presumably caused by organisms which function as symbionts with the plants on which they occur. Although they have been the subject of much research by Frank, Bottomley, Shibata, R. Maire and others during the last forty years, nothing definite is known of the specific nature of the organism involved in the formation of the nodules, and it has been variously placed among the Hyphomycetes, the Actinomycetes and the Bacteriaceae respectively. It is known as *Frankiella Brunchorsti* (Möll.) Maire, and it is an addition to our Yorkshire list.

*Phyllosticta Oxycocci* Henn., and *Cytospora Vaccinii* Died. were found on dead leaves of Cranberry.

*Phoma samararum* Desm. was fairly common on Ash fruits.

The only noteworthy species among the larger fungi collected were the puff-balls, *Lycoperdon pyriforme* var. *excipuliforme*, and *Bovista nigrescens*.

Ten species of Myxomycetes were gathered and among them *Badhamia panicea* and *Stemonitis flavogenita* ; *Trichia varia* occurred parasitised by *Stilbella tomentosa*.

Mr. W. P. Winter afterwards forwarded a small gathering of specimens from Falling Foss among which, the following species may be noted :—*Corticium Sambuci*, *Puccinia Adoxae* Hedw.f., *Bertia Moriformis* de Not., *Nectria ditissima Tul.*, *Phoma Ruborum* Westend., and the Myxomycete, *Trichia persimilis* Karst.

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**Thorne Colliery.** *tom. cit.*, May 20th, pp. 957-960 ; and May 27th, pp. 1005-1010.

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## NEWS FROM THE MAGAZINES.

The *Entomologists' Record* for March contains 'Lepidoptera at Maurin, Basses Alpes,' by A. E. Burras, W. P. Curtis and W. Fassnidge ; 'Notes from Ireland' (on the *Hydraecia nictitans* group), by Canon Foster ; 'Orthoptera and Spiders,' by M. Burr ; 'Notes on Erebiid Species,' by B. C. S. Warren ; 'Cornish Notes for 1932,' by C. Nicholson (Lepidoptera), and numerous notes on Collecting, including a record of the Black-veined Brown Butterfly from Bognor Regis.

The *Entomologist* for April contains 'Notes on the Lepidoptera of Worcestershire,' by E. P. Whitcombe ; 'Larva of *Apatura iris* feeding on Heather!' by C. Nicholson ; 'Arctic Ichneumonidae,' on specimens from Russian Lapland, by C. Morley ; 'Collecting Notes. Lepidoptera' (continued), by C. G. M de Worms ; 'More Cornish Trichoptera,' captured near St. Ives by the Rev. A. Thornley, by M. E. Mosely ; 'The Habits of *Catoptria aspidiscana* Hüb., var. *rubescana* Constant,' by H. C. Huggins. 'A New Oriental Hispine Beetle,' by S. Maulik and numerous notes and observations including a record of the Spotted Flycatcher catching and eating *Vanessa urticae*.

The *Entomologists' Monthly Magazine* for April contains the conclusion of 'The Aquatic Coleoptera of the Channel Islands,' by F. Balfour-Browne; '*Atheta* (*metaxya*) *cambricina*, A Staphylinid Beetle new to Science,' by J. H. Keys (founded on specimens taken in Windsor Forest by Mr. H. Donisthope); 'Arctic Ichneumidæ in the Perthshire Highlands' (including 13 additions to the British list), by R. B. Benson; 'A New Species of *Terracaecilius* (*Psocoptera*),' by J. V. Pearman (*T greeni* sp. n. from Camberley); 'The effects of absence of humidity on the eggs of Dysdercus spp. in the Field,' by A. M. Alston (*Dysdercus* is the 'Red Cotton Bug' of Nigeria etc.); 'Further Comments on Meigen's 1800 paper on Diptera,' by J. M. Aldrick and 'The *Pierinae* in the collection of the late Admiral Edmund G. Bourke, now in the Hope Department of the University Museum, Oxford,' by F. A. Dixey. There are also three short notes including 'A teratological specimen of *Phigalia pedaria* F.,' from Scarborough, Yorks.

*Proceedings of the Cleveland Field Club*, 1928-1932, Vol. IV, Part II, 1932, edited by T. A. Lofthouse, F.R.I.B.A., F.E.S., and M. Odling, M.A., B.Sc., F.G.S. This issue is a welcome contribution to the natural history of the Clevelands. It contains notes of great local interest on 'Place Names,' by Major R. B. Turton, and on 'Wild Flowers,' by Chas. Postgate and M. Odling, and Reports on Cleveland Lepidoptera (T. A. Lofthouse), Coleoptera and Hemiptera (M. L. Thompson). Meteorological observations by M. Odling, and notes on the Alum Industry by H. N. Wilson, and an article from the pen of the late J. J. Burton on 'The Cleveland Whin Dyke' are valuable contributions; a paper on the 'Floods in the Esk Valley, July, 1930, and September, 1931,' by J. W. R. Punch, is a very interesting and well-illustrated account of those disastrous floods. It may be obtained from H. and F. Stokeld, Middlesborough, price 3/-.

Number 26 of Volume IV of the *Natural History Magazine* (Published by the Trustees of the British Museum, London, S.W.7, 1/-, postage extra), contains articles on the Natural History Museum, Berlin; The Southern Sea Lion; A new exhibit of Iguanodon; and two contributions dealing especially with museum arrangements. That describing a scene illustrating British Freshwater Insects should prove of value to all interested in the natural display of specimens. The scene, which has been recently installed in the Insect Gallery of the Natural History Museum, South Kensington, is that of a pond in the Midlands during the month of June. The exhibit is divided at water level in such a way that life above and below are displayed in a manner suitable for study.

The *Transactions of the Entomological Society of the South of England*, Vol. VIII, Part II (1932) contains many very important papers, and keeps up the high standard of this publication which should be in the hands of all entomologists. It contains 'The Prey of British Dragonflies,' by B. M. Hobby (113 observations of the prey of 24 species); 'Synonymic Notes on the Dipterous family Syrphidae,' by E. R. Goffe (*Syrphus*, *Scaeva* and *Xanthogramma*); 'The Parasites of Neuroptera,' by F. J. Killington (25 parasites of 19 species); 'A Preliminary List of British Collembola,' by F. A. Turk (124 species listed); 'Lithocolletis concomitella Bankes (Lep.) and its Allies,' by W. P. Curtis; Descriptions of four aberrations of *Argynnis selene* and one of *Aricia medon*, the former taken in the New Forest and the latter in the Isle of Wight, by W. P. Curtis; 'The Aculeate Hymenoptera of Hampshire: Supplementary List,' by H. P. Jones (20 species of *Apoidea*, 7 of *Vespoidea*, 4 of *Sphecoidea* and 19 of *Chrysididae*, with an appendix of 6 of *Bethylidae*); and 'A Bibliography of Entomological Notes and Papers contained in the serial publications issued by local scientific societies in the British Isles, Part I,' edited by B. M. Hobby (a most valuable compilation).

## YORKSHIRE NATURALISTS' UNION.

### ENTOMOLOGICAL AND PLANT GALLS SECTIONS.

THE Annual Field Meeting will be held at Dent on Saturday, June 3rd, on the occasion of the Union Meeting there. It is hoped that this arrangement will enable a larger number of members and associates to be present.

W. D. HINCKS, *Hon. Sec.*

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NATIONAL MUSEUM

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**The University, Leeds.**

*with the assistance as referees in special departments of*

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# EDITORIAL.

## RETIREMENT OF PROFESSOR GARSTANG.

At the end of the present session Professor Walter Garstang, F.R.S., is retiring from the Chair of Zoology in the University of Leeds, which he has occupied for twenty-five years. His many friends in Yorkshire will hear of this with regret and also that he is proposing to take up his residence in Oxford after his retirement. Professor Garstang's services to Natural History have been great and his interest in the Yorkshire Naturalists' Union and in the Leeds Philosophical and Literary Society have made him very widely known in the North of England. His lectures were always welcome, not only for the knowledge they displayed, but also for their inimitable style. His many friends in Leeds wish to take this opportunity of expressing in some concrete manner, their feelings on this occasion. A testimonial fund has, therefore, been opened and subscriptions may be sent to Dr. Ll. Lloyd, the Treasurer, at Elmsall Lodge, Lidgett Lane, Leeds 8.

## DR. FRANK ELGEE.

Among the honorary degrees conferred at the summer graduation of the University of Leeds was that of Doctor of Philosophy, awarded to Mr. Frank Elgee, Curator of the Dorman Memorial Museum, Middlesborough, in recognition of his services to natural history and archæology. Mr. Elgee's work on North East Yorkshire is well known, and our readers will join with us in congratulating him on the honour he has thus received, and on this timely recognition of his work.

## DR. J. GRAINGER.

Readers of *The Naturalist* will hear with pleasure of the appointment of Dr. J. Grainger as Curator of the Tolson Memorial Museum, Huddersfield. Dr. Grainger is a graduate of Leeds University and, after doing research there, he subsequently spent two years on research in the United States of America. His research work has dealt chiefly with the virus diseases of plants, a subject of great economic importance. His work on horticulture and botany since his return to England is well known in Yorkshire.

The Tolson Museum, under the direction of Dr. T. W. Woodhead, has always been intimately in sympathy with the interests of the Yorkshire Naturalists' Union. In Dr. Grainger, Yorkshire naturalists will recognise the right person to continue this relationship. It may be hoped further that Dr. Grainger's new post will allow him to continue to take an active part in the work of the Yorkshire Naturalists' Union.



JUL 20 1933

## TWO YORKSHIRE WASPS.

### *Chrysis ruddii* Thuck and *Psammochares approximatus* Sm.

A. E. BRADLEY.

Dr. R. C. L. Perkins, in his valuable comments on certain bees and wasps recorded in Messrs. Butterfield and Fordham's 'Aculeate Hymenoptera in Yorkshire' (*Naturalist*, 1933, p. 119) indicates that Frederick Smith's record for the *Chrysis* may possibly be open to doubt. As far as I know, my own record in their supplementary list (*Naturalist*, 1933, p. 69) for Bardsey, near Leeds, 7/6/14 (*not* Bardsley, 7/6/12, as printed), is the only other one we have for Yorkshire, so it seems desirable that something should be said in its justification. My specimen agrees perfectly with the Rev. F. D. Morice's description in his 'Annoted Revision of the British Chrysididæ,' 1896. The only other Ruby Wasp with which it could be confused is the common *C. ignita*, which is also quadridentate behind and similar in size and *dorsal* colouring. Apart from certain less conspicuous differences, my capture may be recognised at once as *C. ruddii* by the very strong fiery-red reflections on the undersides of the legs. According to Morice, this character is never found in *C. ignita*. I may add that for many years I have been familiar with *C. ruddii* in West Carnarvonshire, where it seems to be the commoner of these two species.

Dr. Perkins suggests that one *Psammochares approximatus* Sm. might possibly be *P. cardui*, an allied species described by himself in 1916. I have compared the beautifully fresh ♀ I took at Collingham (see *Naturalist*, 1933, p. 69) with Dr. Perkins' original description of *P. cardui*, and also with his comparison of that species with its two near allies (*Ent. Mon. Mag*, 1920, p. 36). According to these I can say with certainty that my specimen is not *P. cardui* (nor *P. nigerrimus*), but *P. approximatus* Sm. I cannot speak for the one from Buckden, bred by Mr. Butterfield (see *Naturalist*, 1930, p. 368).

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**Trioza velutina Först. in Cumberland.**—I possess a single Cumberland example of this rare species, taken near Easton in the Longtown district. It was swept in a grassy lane on 25/6/29. I am uncertain what plant it came from, but saw no Bilbery near. It has already been recorded from another part of the county in the *Ent. Mo. Mag.*, 1918, pp. 114-115. I have also met with it very sparingly in Dumfriesshire by general sweeping.—Jas. Murray, Gretna.

# BOLTONIANA

F. A. MASON, F.R.M.S.

James Bolton's pioneer studies of the toadstools about a hundred and fifty years ago have had an indelible influence on the science of mycology, especially in the field aspects of the subject. In the fidelity of his drawings of the fungi both in form and in colour, and in his descriptions of species and of their habitats, Bolton's spirit still survives. He was one of the first botanists to express his aversion to the unnecessary multiplication of specific names. To quote his own words, 'there is no order of plants, where we are so liable to slip into errors of that kind, as in the Fungusses. There is a pride in man, to be thought the inventor or discoverer of something new. In regard to things useful, this is a laudable vanity; but to add a new name to a known plant . . . . . because we meet with an individual perhaps distorted in its shape, diminished or increased in its quantity, sickened by improper food or soil, or tinged with colours different from those of its own species, this is not only vain and ridiculous in itself, but pernicious in its consequences.' The occurrence of the familiar and authoritative 'Bolt.' in our systematic books on British Fungi indicates that when Bolton resorted to the practice of giving a new name, such name was really necessary.

Apart from the universal recognition of Bolton's genius by mycologists, any new fact regarding his life, or any fresh evidence of his artistic skill possesses special interest for Yorkshire naturalists. Following the return of Dr. L. C. Shear to the United States of America after his visit to England and his welcome attendance at the Whitby Fungus Foray, in 1931, the writer was informed of the discovery at Zurich of Bolton's original drawings and of their acquisition by the Library of the U.S. Department of Agriculture. Many readers will be familiar with the fruitless searches for these drawings made by Mr. W. B. Crump and the late Charles Crossland about thirty years ago, and of the conclusions reached that they must have been destroyed by fire in the early years of last century; we are glad to learn of their discovery and of their preservation for posterity.

Under the title, 'The Manuscript of James Bolton's *Icones Fungorum circa Halifax Sponte Nascentium*,' Dr. Shear, in the current number of the *British Mycological Society Transactions*[1] (also noticed elsewhere in this issue), has now published a very interesting account of the original notes and drawings which appear to be preserved in a condition little

[1] Vol. XVII, Part IV, pp. 302-307.

altered since they left Bolton's hands. As described by Dr. Shear the manuscript consists of six folio volumes bound in boards with morocco back. The paper is heavy hand-made with rough surface very suitable for water-colour illustrations, and they include 244 water-colour plates representing the plants mostly in their natural size. The volumes cover a period of eight years. 'The first volume is dated 1784, and the note at the end of the sixth is dated January 5th, 1792. A comparison of the plates in the manuscript with those in the published work shows that all the species in the printed volumes are found in the manuscript volume and also a few not published. In the manuscript the species illustrated are all on separate plates, whereas in the printed volumes several small species, sometimes four, are combined on a single plate. In the manuscript the species illustrated are arranged in the order in which they were collected and drawn. When they were transferred to the copper plates for printing they were rearranged and renumbered.'

Dr. Shear also refers to the inclusion of notes not printed in the published work and the two following quotations may be reproduced here for the sake of their intimate Yorkshire associations :—

*AGARICUS RUBEUS*, HIST. 36.
Red Agaric.

This new and beutiful species I gathered in company with my Friend, Mr. Paul Shackleton the Entimologist, in a little Wood at Shibden Hall near Halifax, October ye 29th, 1786.

Gills in three series, transparent in some lights, and of a Ruby colour. Pileus looks like Pillow Fustin made of dark red Cotton. Stem tough solid crooked and near the root a little swell'd. No volva. I never met with it before or since.

*SPHAERIA MORI* HIST. 120. f.1.
Mulberry Sphæria.
*Sph. fragiformis.*

This Sphæria was brought me by Wm. Alexander, M.D., a most ingenious Botanist and steady Friend, who has accompanied me in many of my most arduous and extensive Botanic rambles, has swormed the dreary precipices at Ingleborrow, Skiddow, yeGlydar, and Criby destillh, with a spirit and Resolution wh. Indicates a true Botanic Genius.

The Sphæria grew on the Bark of a fallen Maple Tree near his House in Halifax,—.

I have figured it as it appeared under magnifiers of two different powers.

# A POSSIBLE FUNCTION OF THE HAIRS IN CERTAIN LEPIDOPTEROUS LARVÆ.

GEO. B. WALSH, B.Sc.

Many species of larvæ in certain families of the Lepidoptera, *e.g. Arctiadæ, Ocneriadæ, Lasiocampidæ,* are noteworthy for their more or less dense covering of hairs. In all probability these hairs serve a variety of functions : in some cases, *e.g. Porthesia chrysorrhoea* Linn., *Euproctis phæorrhoea* Don., they are protective in function owing to their urticating properties ; in some others, *e.g. Lymantria dispar* Linn., *Orgyia antiqua* Linn., the present writer has suggested (' The Origin and Distribution of the Coast Coleoptera of the British Isles,' *Ent. Mon. Mag.*, Vol. LXII, 1926, p. 228) that they function in assisting dispersal by wind immediately after eclosion from the egg.

It would seem probable, however, on *à priori* grounds that the presence of numerous hairs on a larvæ would materially reduce the rate of loss of water from the body just as hairs on certain plants, *e.g. Tussilago, Verbascum,* reduce the rate of transpiration from a leaf-surface ; if this be true, it will presumably be most effective in the case of hairs lying along the spiracles.

To test this hypothesis, experiments were carried out last year (1932) with larvæ of *Arctia caja* Linn. and *Diacrisia lubricipeda* Linn. To remove the hairs as completely as possible, particularly along the spiracular lines, the larvæ to be tested were clipped with fine scissors, care being taken not to cut so closely as to cause obvious bleeding. The larvæ were then placed in an empty tin for at least 24 hours till the intestine was emptied of food. A number were then weighed on a chemical balance. These were then placed in a desiccator containing calcium chloride as drying agent, the larvæ being removed from contact with it by a piece of wire gauze. The idea of this was to ensure exactly parallel conditions for the shorn larvæ and their unshorn controls, to increase, if possible, the rate of transpiration, or on the other hand to prevent its possible check by a damp atmosphere. After a period varying from 10½ to 24 hours, the larvæ were removed and weighed again. As a control the experiment was carried out at the same time and in the same way with a number of unshorn larvæ. In the case of *Arctia caja*, the experiment was repeated with other larvæ in order to check the results obtained.

During later consideration of these results, it seemed possible, however, that the excess of loss from the shorn larvæ might be due to a slight degree of bleeding from the cut hairs. It was too late then to repeat the experiment in

1932, but it was again performed with *A. caja* larvæ during the present year, 1933. This time, after the larvæ had been shorn, they were replaced on the food plant for five days so that any possible bleeding from the cut hairs should have ceased. Operations were then repeated as before.

In every case the larvæ were in their last instar as this facilitated shearing. It is understood, of course, that the loss of weight recorded includes loss of carbon dioxide as well as loss of water, but this does not invalidate the general results of the experiments, as the carbon dioxide loss is relatively much the less.

| SPECIES | Year | Character of Larvæ | No. | Length of Experiment | Original Weight | Final Weight | Loss of Weight | Percentage of Loss |
|---|---|---|---|---|---|---|---|---|
| *A. caja* (*a*) | 1932 | Shorn | 8 | 14 hrs. | 7·2020 gms. | 6·9990 gms. | 0·5030 gms. | 7·0 |
| | | Hairy | 8 | 14 hrs. | 5·8171 gms. | 5·5819 gms. | 0·2352 gms. | 4·0 |
| *A. caja* (*b*) | 1932 | Shorn | 7 | 10½ hrs. | 7·2713 gms. | 6·7894 gms. | 0·4819 gms. | 6·6 |
| | | Hairy | 7 | 10½ hrs. | 7·4765 gms. | 7·2012 gms. | 0·2753 gms. | 3·7 |
| *A. caja* (*c*) | 1933 | Shorn | 7 | 16½ hrs. | 7·6288 gms. | 7·2875 gms. | 0·3413 gms. | 4·5 |
| | | Hairy | 7 | 16½ hrs. | 12·6720 gms. | 12·4061 gms. | 0·2659 gms. | 2·1 |
| *D. lubricipeda* | 1932 | Shorn | 7 | 24 hrs. | 2·4371 gms. | 2·0899 gms. | 0.3472 gms. | 14·2 |
| | | Hairy | 7 | 24 hrs. | 2·2646 gms. | 1·9373 gms. | 0.3273 gms. | 14·4 |

*Conclusions.*—The results would seem to warrant the following conclusions :—

(1) As the percentage of loss in the 1933 experiments was less than that in those of 1932, it would seem that there had been at first a small amount of loss of water from the cut hairs.

(2) In some species, *e.g. Arctia caja*, but not in all, *e.g. Diacrisia lubricipeda*, the hairs do actually function in reducing loss of water from the body.

(3) From a comparison of the results with the two species, it seems that the rate of loss may be partly dependent on the size of the body, the larger larvæ losing relatively less water than the smaller larvæ ; if this be so, it will be in harmony with the general relation between body weight and surface functions.

*Note.*—It is difficult, if not impossible, in the present state of our knowledge, to state whether the reduction of transpiration due to the hairs in some cases is merely a result of the presence of the hairs or whether it is functional, and so of actual physiological value—and therefore of survival value—to the species ; as it occurs in some species and not in others, the latter would appear to be the correct view, though we cannot yet state in what direction the value may lie.

# SOME ECONOMIC ASPECTS OF THE VIRUS DISEASES OF POTATOES.

JOHN GRAINGER, PH.D.

FIELD naturalists are probably much more familiar with virus diseases than may at first be imagined. There is a very common leaf-mottling ' Mosaic ' disease of the dock, and a similar malady on dog's mercury. If the naturalist be also a gardener, his raspberries are almost certainly attacked by a mosaic disease, his black currants are susceptible to ' reversion,' whilst his potatoes are attacked by several distinct virus maladies, all of which reduce the yield severely.

A virus is an extremely small particle, probably about a millionth of an inch across, and forty times smaller than the average bacterium. It is infectious and multiplies within the host-plant (or animal) which it attacks. Its effects are not, however, commensurate with its size, as will be seen later. Many philosophical studies have been made upon viruses, but their practical significance, though not neglected, is not fully realised. The potato crop is a very important one in Yorkshire, about 60,000 acres being grown in the county. Infection with virus disease makes it necessary for growers to spend large sums of money on the purchase of fresh stocks of seed from a relatively virus-free source (*i.e.* Scotland and Northern Ireland).

The chief diseases are Crinkle, Interveinal Mosaic, Mild Mosaic and Leaf-roll. Crinkle causes a considerable lobing of the margins of infected leaflets, with waving and crinkling of the lamina. A mottling of well-marked light-green areas also appears. The whole plant is stunted. Interveinal Mosaic also produces a mottle upon the leaves, but the light-coloured parts are more diffuse than in crinkle, and are found between the main lateral veins. There is no malformation, and the plant is not greatly reduced in size. Mild Mosaic gives only a very faint mottling and no malformation. Leaf-roll causes the plant to become very dwarfed, and to appear generally chlorotic. The leaves stand rather stiffly in a vertical position, and the leaflets are rolled in a funnel-shaped manner. In the early stages of infection the lowest leaves have their margins only incurved.

Some idea of the reduction in yield caused by particular viruses can be obtained from Table I, which shows the average yields of about 40 plants of each kind grown at Weetwood, Leeds, on heavy land not particularly suited for potato growing. Table II shows the relative yields of healthy and diseased plants grown on a light soil more suitable for

potato growing. Mr. J. France, of Linthwaite, Huddersfield, kindly placed his garden at the writer's disposal for this test.

## TABLE I.

(Average weight of produce per plant at Weetwood, Leeds)

| *Variety.* | *Healthy.* | *Interveinal mosaic.* | *Crinkle.* | *Leaf-roll.* |
|---|---|---|---|---|
| | lb. oz. | lb. oz. | lb. oz. | lb. oz. |
| President ... | 1 13 | 1 8½ | 1 8½ | — |
| Majestic ... | 1 14 | 1 9 | 10½ | — |
| Arran Victory ... | 1 14 | — | 1 3½ | 15 |

## TABLE II.

(Average weight of produce per plant at Linthwaite)

| *Variety.* | *Healthy.* | *Mild mosaic.* | *Leaf-roll.* |
|---|---|---|---|
| | lb. oz. | lb. oz. | lb. oz. |
| King Edward ... | 3 8 | — | 13 |
| Kerr's Pink ... | 3 4½ | — | — |
| Majestic ... ... | 4 3 | 2 15 | — |

Seeing that virus diseases cause such drastic reduction in the yield of individual plants, it follows that the more diseased plants there are in a crop, the lower will be the yield. Insects spread the diseases from plant to plant in the field. The potato-growing districts of England have large numbers of insects, particularly aphids, and, therefore, virus diseases are there spread quickly. The stocks rapidly become totally infected with the diseases, the yield falls, and the growers must obtain fresh stocks from areas where insects are scarce, viz. Eastern Scotland or Northern Ireland. It is no uncommon experience to find that one diseased plant will infect sixteen surrounding plants in a lowland area, whilst in Scotland and northern Ireland the disease rarely spreads to more than one surrounding plant. Nevertheless, ordinary Scotch seed frequently contains up to about 30 per cent. of virus-disease-bearing tubers, and rarely has less than about 12 per cent. English growers, therefore, start with a considerable amount of disease in their stocks, and it is greatly to the credit of the Scotch and Irish seed raisers that they have put on the market virus-free potato seed before most English growers have realised the need for it. Such virus-free seed has been given the rather inappropriate name of ' Stock Seed,' and is certified by the respective Ministries of Agriculture of Scotland and Ireland as having less than one per cent. of virus disease. It is the purpose of this paper

to show the benefits which can accrue to English growers of potatoes, through using virus-free seed.

Through the courtesy of Messrs. Jackson Brothers, Farmers, of Thorpefields, near Thirsk, Yorks., a field was planted with alternating plots of ordinary fresh Scotch seed and Stock seed (called by them 'pedigree'). Each plot was $4\frac{1}{2}$ sq. chains in extent, and was separated from its neighbours by a belt of oats twenty feet wide. For comparison, about an acre was planted with seed thrice grown in the neighbourhood of Thirsk. The variety was Arran Consul, and the different plots were planted at the same time.

The 'Pedigree' (Stock) Scotch seed produced a crop which had, on an average, one virus-diseased plant in every long row (about 270 ft.). The ordinary Scotch seed had 22 diseased plants in the same length, whilst the thrice grown seed had 95 virus-infected plants per row. These differences are reflected in the average yields (expressed in tons per acre) :—

**TABLE III.**

| *Thrice grown.* | *Ordinary Scotch seed.* | *'Pedigree' (Stock) seed.* |
|---|---|---|
| 6 tons 10 cwt. p.a. | 11 tons 4 cwt. p.a. | 12 tons p.a. |

There is thus an increased yield of 16 cwt. per acre due to the relative freedom from virus disease. The few diseased plants were removed from the Stock Seed plots, so that seed from them should be still relatively free from virus next year. Experiments at Weetwood, Leeds, show that virus-free stocks of potatoes can be planted year after year in Yorkshire without diminution in yield.

New Stock seed costs a pound or two more per ton than ordinary Scotch seed, but with reasonable care in rogueing the few diseased plants which occurr, it can be grown for at least twice as long as ordinary seed in a lowland area. Moreover, the increase in yield due to freedom from virus will be felt each year. The use of Stock seed is a commercial proposition.

It must be remembered that virus-free seed is also produced in the northern districts of Ireland, and the same remarks apply with equal force to seed from that source. Lists of growers of Stock seed are published by the respective Departments of Agriculture in Belfast, Dublin and Edinburgh.

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**Gagea Lutea.**—Two specimens of *Gagea lutea* have been found in a field on the east of Ripon Race-course. This is the first time in ten years that it has been brought to me from any spot to the south of the town. Previously I have only known it above the confluence of Laver, Skell and Ure.—D. W. Burch.

## FROM A MICROSCOPIST'S NOTE-BOOK.

W. Lawrence Schroeder.

Some years ago, on April 17th, friend passed over to me one or two pieces of *Elodea canadensis* taken from a dam in the Blakeburn Valley. The weed showed little that was noteworthy, save some snail-spawn. I put the stuff in a jar to watch the development of the snails. On the 24th of the month I looked over the weed carefully, but there was nothing remarkable. On May 17th I found that a number of healthy *Melicerta ringens*—a tube-building rotifer—had fashioned their dwellings both on the weed and on the side of the jar. Work must have proceeded at a wondrous pace.

On February 18th, some years ago, I watched the fission of a Sun animalculum—*Actinophrys sol*—about $\frac{1}{250}$ in. in diameter. A constriction appeared about 10-5 p.m. : half an hour later the connections, three in number, were about $\frac{1}{2000}$ in. thick ; the halves drew away from each other slowly and steadily. At eleven o'clock there was a single strand of protoplasm, and ten minutes later it was invisible under $\frac{1}{6}$ in. with 10x eyepiece. At the final separation, which probably took place at 11-15 p.m., the creatures were about $\frac{1}{70}$ in. apart. The parting was a quiet, unexciting, dignified activity. *Non sunt lacrymæ rerum.*

I once took *Bosmina longirostris*, one of the Cladocera, water-fleas, from some water near Halifax. I mentioned the fact to one of the brethren : he looked at me and said, ' Are you quite sure? ' He was apparently touched by the temper of the sceptical angler who naturally doubts the story of any unusual catch. My indignation found relief in verse :—

To unfold the wondrous story
How we gained a way to glory,
By the capture of *Bosmina* from the pond in Elland Wood :
Is to court a reputation
For the art of fabrication
Out of dreams and vicious fancies, that must sternly be withstood.
It is only when the creature,
With its quaint and trunk-like feature,
Palpitates in vain resistance on the microscopic slide ;
That the mind of the beholder,
With the vision, waxing bolder,
Will admit the possibility of something more than ' side.'

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**Insects, Man's Chief Competitors,** by **W. P. Flint** and **C. L. Metcalf.** Baillière, Tindall and Cox, viii+134 pp., 12 figures, 5/6. The authors of this book are well-known American Entomologists who here present a simple account of insects from the economic point of view. Some account is given of certain of the more well-known injurious insects and of the methods adopted by agriculturalists for their control and elimination.

# ADDITIONAL RECORDS OF COLEOPTERA FROM THE KINGMOOR (CUMBERLAND) NATURE RESERVE.

F. H. DAY, F.E.S.

In *The Naturalist*, 1915, pp. 190, 191, and again in 1923, pp. 147-149, I published lists of several Orders of Insects taken in the Kingmoor Nature Reserve just outside the urban area of Carlisle. Since that time I have paid one or two visits annually to the Reserve, on each visit invariably meeting with species previously unknown there, and the object of the present paper is to record some 32 species of Coleoptera new to the initial lists. The first list in 1915 dealt with 256 species, the second in 1923 with 78 species. The present contribution therefore brings up the total to 366 species which is about one fifth of the number of Coleoptera recorded for the whole county of Cumberland. When it is pointed out that Kingmoor is a small area of less than 50 acres, close to a city of over 50,000 inhabitants, and open to the public, this is a surprising proportion.

It is, however, a tract of land entirely primitive in character, for which reason much of its life has been preserved.

The sub-soil is of a clayey nature, overlaid with a thin peaty surface soil, and the vegetation is of a bog or moorland type. Of late years a great number of birches have sprung up on the moor and threaten to take possession of the open spaces. This circumstance is giving some concern to local naturalists, who point out that unless drastic steps are taken by the Museum Committee, under whose auspices the Reserve is administered, to put a check on the spread of the birch, in course of time the Reserve will be little more than a birch wood, and more interesting forms of life (plant, bird and insect) will be crowded out.

*Pterostichus strenuus* Pz. Common in moss.
*Bembidion mannerheimi* Sg. Occasionally on paths.
*Hydroporus tristis* Pk. A few in a peaty pond.
*H. melanarius* St. Two specimens under clods in a dried-up pond. This is a sub-alpine species which in Cumberland has otherwise only been found at considerable elevations.
*H. striola* Gy. (*vittula* Er.). Several in pond.
*Agabus guttatus* Pk. Under stones in a small stream.
*Oxypoda elongatula* Ab. (*longiuscula* Er.). In decaying vegetation.
*Atheta coriaria* Kr. Two specimens in an old magpie's nest.
*A. soror* Kr. In moss.
*A. angustula* Gy. One specimen under bark.
*Bolitochara lucida* Gr. Scarce in a dry fungus on stumps of trees.
*B. obliqua* Er. With the last, rather common.
*Oligota apicata* Er. One under beech bark.
*Myllæna brevicornis* Mh. In moss and dead leaves, common.
*Quedius fumatus* S. In dead leaves, scarce.
*Gabrius trossulus* Nr. In heaps of dead grass, scarce.

*Stenus fulvicornis* S. (*paganus* Er.). By sweeping vegetation.
*S. bifoveolatus* Gy. In *Sphagnum*, sparingly.
*Lathrimæum unicolor* Mm. In dead leaves, etc., common.
*Bythinus puncticollis* Dy. One in moss.
*Myrrha* 18-*guttata* L. Beaten from various bushes.
*Exochomus* 4-*pustulatus* L. One specimen crawling up a birch trunk.
*Brachypterus pubescens* Er. (*glaber* S.). On nettles.
*Epurea pusilla* Il. Beaten from sallow and other bushes.
*Cerylon histeroides* F. Under bark of various trees.
*Enicmus minutus* L. Common in the sweeping net.
*Prasocuris junci* Bm. On brooklime in a small stream.
*Rhynchites longiceps* Th. (*harwoodi* Jy.). On birch, etc.
*Apion striatum* K. A few on broom.
*A spencei* K. Common by sweeping.
*Phytonomus plantaginis* D.G. Sparingly by sweeping.
*Micrelus ericæ* Gy. Abundant on heather.

## TRIOGMA TRISULCATA *Schum.* AND OTHER YORKSHIRE DIPTERA.

CHRIS. A. CHEETHAM.

Amongst the Limnobids, one of the smallest sub-families is that of Cylindrotominæ, of the four genera, each consisting of a single species, two are fairly well known in Yorkshire. By some mischance Wingate omitted *Triogma* in his analytical keys, although it is in those of Schiner on which most of Wingate's work is based. I caught a single male at Thieves' Moss on May 23rd. Dr. F. W. Edwards informs me that he only knows a single specimen from Coughton Marsh besides those taken by A. E. Carter at Blairgowrie, all these were caught during the first two weeks of May. Subsequent visits to the Austwick locality have not been successful and probably the beginning of May would have been a more hopeful time.

Another addition to our diptera list is *Empis borealis* L. I found this flying in a clearing in a pine wood at Eldroth on May 18th. A week later the opening blooms of the Globe flower, *Trollins europæus*, gave an opportunity to collect *Chiastochæta trollii*, Zett. in great numbers wherever the flower was found, it has not been previously recorded for Yorkshire. Lastly, on a visit to Pennyghent on May 13th Dr. Edwards caught *Metriocnemus tristellus* Edw., a species he described in his paper on British Non-biting Midges. *Trans. Ent. Soc.*, 1929, from specimens taken in Cambs. and Herts.

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On May 21st I visited a small chalk quarry at the top of Elloughton Dale, which lies one mile east of South Cave. To my surprise I discovered four examples of the echinoderm *Infulaster excentricus* (Forbes). One specimen in particular was extremely well preserved. The quarry is in the zone of Holaster planus. The finding of several specimens of such a rarity in close proximity seems worthy of placing on record.—Robert M. Stainforth.

## GIANT SQUID (new to Science) AT SCARBOROUGH.

W. J. CLARKE.

In the early morning of January 14th, 1933, the writer received a message that a large Shark had washed ashore in the South Bay at Scarborough. On the way down to view it, it grew into a Whale, but on arrival the mysterious creature was found to be an immense Squid. Someone had cut off the tips of the two longest tentacles and taken them away, the total length of what was left was 17 ft. 5 in. The length of the body from the front edge of the mantle to the tip of the tail

**Architeuthis Clarkei at Scarborough.**

was 5 ft. 8½ in., while the length of each short arm was 7 ft. 1 in. The colour was chestnut brown, darker on the back, paler beneath, the insides of the arms and the stalked suckers were white. Realising the extreme rarity of these huge Cephalopods, the writer made arrangements for the creature to be sent to the Natural History Museum at South Kensington. There it duly arrived and a search was at once instituted for the missing portions of the tentacles. A wireless appeal for their return was broadcast, and it was eventually discovered that they had been taken away by a local fisherman who did not know what to do with them and who eventually dropped them into one of the offal barrels on the Fish Market. From here they went to a manure factory at Hull, where, on enquiry, it was learned that they had been seen, but the enquiry for them had not come in time and so they were converted into fertilizer. The length of the portions so lost was estimated at about 18 in. off each tentacle, including all the suckers,

which makes the total length of the Squid about 20 ft. One of the horny mandibles which had also been cut out by a souvenir hunter was recovered. The animal was very much damaged in other ways by the crowds of spectators who danced on its body, scrubbing off the delicate outer skin until only vestiges remained. On its arrival at the British Museum the Squid was found to agree with no known species. It was a kind of Architeuthis, a family which includes the largest known species of these deep-sea creatures, and after prolonged enquiry it has been named *Architeuthis clarkei*. A full description of the Squid, by Mr. G. C. Robson, of the British Museum, will appear shortly in the *Proceedings of the Zoological Society*.—W. J. Clarke.

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# In Memoriam.

## HERBERT KNIGHT HORSFIELD.

Yorkshire Ornithology suffered a severe loss by the death of Herbert Knight Horsfield, who passed away peaceably at his home at Filey on November 16th, 1932.

Horsfield was a Sportsman and Field Naturalist of the very best type. He was an author of considerable repute ; he had a gift for writing and could put his observations before the public in a pleasant and popular form, without departing from a high standard of truth. His ' Nature Notes,' contributed for over twenty years to *The Yorkshire Weekly Post*, are an example of accuracy which many other writers on similar subjects would do well to emulate.

The author of several books, his, *Sidelights on Birds*, and *English Bird Life*, gave pleasure to a wide circle of readers by the great amount of genuine first-hand knowledge, which is contained in their covers, and *In The Gun Room*, is a number of delightful sketches of Sport and Natural History. He also published a couple of novels and a volume of verse, all of which were well received and were monuments to his versatility. He was also a regular contributor to *The Field, Sporting and Dramatic, The Badmington, Blackwood, The National Review*, etc.

One of the oldest members of the B.O.U., joining in 1888, and one of the original members of the B.O. Club, his friends numbered practically the whole of the older generation of naturalists : Dresser, Seebohm, Newton, Sanders, Tegetmier, Eagle Clarke, etc.

The loss of his wife was a great blow to him, which only the devotion of his daughter helped to soften. A few years ago he had, unfortunately, to undergo an operation, from which he never really recovered. Of late years he had

interested himself in the study of Theosophy, of which he was a strong advocate.

He was born in Leeds in 1856, where for many years he was connected with the leather trade. When he retired from business, in 1905, he went to live at Filey, and his home there, perched on the top of the cliff, was an ideal observation post for an Ornithologist, overlooking as it does the whole of the bay and the extensive cliffs of the Flamborough Headland. There he devoted himself to writing, mainly on subjects connected with Natural History and Sport.

The writer, who had the great privilege of his friendship, together with hosts of other friends, sincerely deplores the loss of his charming personality. May he rest in peace.—R. F.

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## WALTER JOHN GYNGELL.

The death of Walter John Gyngell at the age of 76, which occurred on May 27th at his home in Scarborough, has removed a well-known member from the ranks of Yorkshire naturalists.

Gyngell descended from a family of showmen. His great grandfather, Daniel Violet Gyngell was a clever performer of tricks of sleight of hand, and travelled with his own show in 1815. Amongst other attractions he exhibited a Dutch dwarf named Sampæman. Most of the members of the family—Joseph, Horatio, George and Louisa—were engaged in the show in one capacity or another.

His grandfather, Lionel Violet Gyngell, was a firework maker, and his father, George Augustus Gyngell, followed the same occupation and was also an expert and well-known conjurer.—W. J. Clarke.

My personal acquaintance with him goes back for a period of over thirty years.

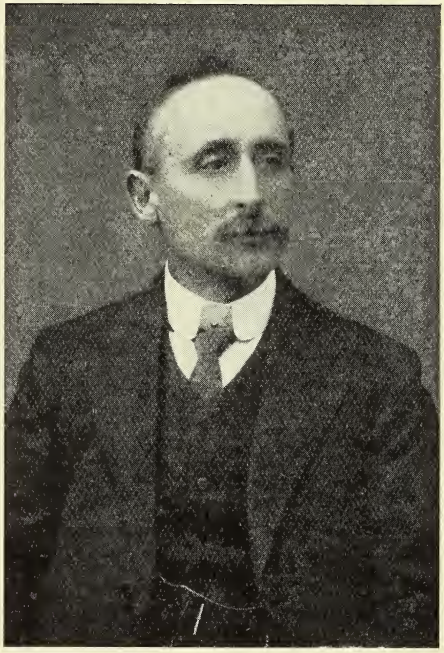
Gyngell was one of the best all-round naturalists I have ever known, though he was first and foremost an Ornithologist and Conchologist. Few men that I have met had as good, and none a better, ear for the songs and notes of birds. He was a scrupulously careful and exact observer, and in this respect he had a great influence on those of us who were less experienced; and the younger naturalists with whom he came in contact always found him eager to help and advise them. He kept copious notes of his observations, and he once told me that he had a record of every bird's nest and eggs that he had found since he began to study and take an interest in birds.

For many years Gyngell made an intensive investigation into the molluscan life of the Scarborough district. It was

largely owing to his enthusiasm as a collector, and his painstaking searching, that the list of land and freshwater mollusca was completed, and he added immeasurably to our knowledge of this branch of natural history.

But his interest in nature was too wide to be confined only to birds and shells. Wild flowers, geology, insects, and, indeed, all aspects of wild life made a strong appeal to him, and he brought to bear on these the same critical faculties that he employed in the study of his special branches.

As I remember him he was a man of simple tastes, with a



keen sense of humour ; a love of the beautiful, and an inate tenderness of heart that made cruelty in any form abhorrent.

There was a strong vein of scepticism in his nature which made him demand scientific proof where others might be content with generalities. He had little use for theories. I remember discussing with him the theory of protective colouration and mimicry. He would neither accept nor reject the theory. ' It can't be proved one way or the other,' he said, ' because we don't know that animals see colour and form as we do. It's all based on human experience.'

This sceptical attitude made him, at times, ultra-critical of the opinions or statements of others. ' I believe nothing

that I cannot understand or verify for myself,' he said to me once when we were discussing a philosophical problem. It was, perhaps, this scepticism that made his observations and statements so accurate and valuable.

Gyngell had a Catholic taste in books ; he read poetry and fiction with the same keen delight that he read scientific works.

It was due to his inspiration and influence that the Scarborough Field Naturalists' Society was founded. The first meeting took place in a room behind Gyngell's shop in Westborough, when five local naturalists, W. J. Clarke, the late J. A. Hargreaves, C. D. Head and J. H. Rowntree were also present. From that meeting in, I believe, 1888, sprang one of the most vigorous and successful Natural History Societies in Yorkshire. Gyngell, of course, took a very active part in its affairs, and devoted all his spare time to its organisation, to the making and keeping of records in his own branches of study, and for many years he rarely, if ever, failed to attend the fortnightly meetings.

Of late, failing health and strength prevented Gyngell taking any active part in the Society he founded so many years ago, but right up to the end he was as keenly interested in Nature as ever.—E. Arnold Wallis.

## FIELD NOTES.

**Mating of Acilius sulcatus.**—Whilst seeking larvæ in a pond near Bradford, on the evening of May 12th, I took in the dredge what appeared to be a burly water-beetle. Upon examination I found two specimens of *Acilius sulcatus*, ♀ and ♂ (family Oytiscidæ), in contact. They jumped vigorously about in the dredge, separated, and so I returned them to the pond. I got another pair in contact shortly afterwards; these behaved in the same manner and I lost the ♂. I placed the ♀ in a tube. Later, I caught another pair whilst they were swimming in the shallow water. They jumped about in the dredge, but the ♂ clung firmly to the ♀. On examining them in a tube, I could see the ' sucker-pads ' being just behind the female's eye. As they rose to the surface of the water I observed the ♂ bend down the tip of his abdomen, extend the ædcagus and penetrate the ♀. This was successfully performed at least six times, shortly after captive. During the operation, on two or three occasions, the ♀ discharged a black soluble fluid from the underpart of the thorax. During the evening I saw at least two more pairs of these beetles swimming about in contact, but too far from the bank to secure. I kept a close watch on the pair in the tube, the male retaining his grip from 8 p.m. until 11-30 p.m. at

least; how long after that I don't know. Next morning they had separated. The ♂ is evidently impelled to retain his grip upon the ♀ by a prolonged sexual impulse. After three and a half hours the ♂ repeatedly attempted penetration, the ♀, however, easily evaded the efforts of the ♂ by movements of the abdomen. On May 15th I found a few large, elongated white eggs in the vessels containing the two females.—M. Longbottom.

**Nightingale and Waxwings at Scarborough.**—In addition to the records of Waxwings in the Scarborough district, printed in *The Naturalist* for March, 1933, the following have come under my notice: 'Six were seen feeding on cottoneaster berries in a garden in Alexander Park on February 20th. Two more were seen on February 27th in Stepney Drive.' Both these localties are well within the Borough boundary. On May 1st a Nightingale took up its residence in Peasholme Glen, and sang almost nightly until May 26th. There is no evidence that it had a mate, or nested. This is the fourth authentic record for the Scarborough district.—W. J. Clarke.

**Rare Cephalopods at Scarborough.**—On March 4th, 1933, while examining the contents of cods' stomachs taken from fish caught about 12 miles N.E. off Scarborough, I found a complete example of *Rossia macrosoma*. This little creature does not appear to be very common in our water. On March 11th, 1933, a female example of the Giant Squid, *Ommastrephes sagittatus*, measuring 3 ft. 11 in. over all was stranded on the North sands at Scarborough. Perfect when it first came ashore it was much mutilated by sight-seers before I got to it. The remains were sent to the British Museum. On March 31st, 1933, a very perfect little male example of *O. sagittatus* came ashore alive in the South Bay at Scarborough and was fortunately secured before anyone had the opportunity to pull it to pieces. It measured 34 in. over all and was sent to the Hull Museum. *O. sagittatus* appears to be stranded on the Yorkshire coast more frequently than any other of the large Squids.—W. J. Clarke.

**Ribbon fish at Robin Hood's Bay, Yorks.**—On Wednesday, May 3rd, 1933, a strange fish measuring 12 ft. in length, 12 in. broad, and $4\frac{1}{2}$ in. thick was found stranded, and not quite dead, at Robin Hood's Bay by Mr. Oliver Storm. The colour was bright silvery with a blood-red dorsal fin extending the whole length of the body. The anterior rays on the top of the head were greatly elongated, two only remained unbroken and these measured 3 ft. $2\frac{1}{2}$ in. each in length. As usual, with these abyssimal fish which

are constructed to withstand the enormous pressure of great depths, the tissues of the creature had become very brittle, and it fell to pieces when an attempt was made to remove it. The red colour of the dorsal fin is not usual in this species, but is characteristic of another closely related, the Deal Fish. Careful examination of sketches, photographs, and descriptions however seem to leave no room for doubt that the creature was a Ribbon Fish (*Regalecus glesne*), and after seeing the material available, Mr. J. R. Norman, of the British Museum, says, ' You will be fully justified in recording the fish as *Regalecus glesne*.' Seven Yorkshire records for this fish are given in the ' Handbook of Yorkshire Vertebrata,' to which I can add one other which was taken at Flamborough about 50 years ago. I saw the specimen but have no note of the exact date, and it does not appear to have been recorded. It was stuffed by a Scarborough taxidermist named Thompson, and exhibited by him on the Foreshore in company with a Basking Shark, caught about the same time.—W. J. Clarke.

**Fulmar Petrel attacking a Rabbit.**—Fulmar Petrels have taken possession of the Scarborough Castle Cliff this season in greater numbers than ever before. Early in May a Scarborough fisherman named W. Bayes, a man familiar with the Fulmar on the fishing grounds, was walking on the Marine Drive at the foot of the cliff when his attention was attracted by a screaming in the air overhead. On looking up he saw a ' Mollehawk ' (the fisherman's local name for the Fulmar) carrying a small mammal, which it eventually dropped on the Drive. On picking it up it proved to be a young rabbit about 8 in. long. One wonders what motive impelled the Fulmar to make the attack. A similar instance was recorded last year at the same place, but in that case the bird was a Herring Gull, a much more likely species to do such a thing.—W. J. Clarke.

**Dispersal of Species by Commerce.**—On March 5th, a large bird-eating spider belonging to the genus Lasiodora, was found alive at Scarborough in a bunch of bananas from Honduras. It was sent to the insect house at the Zoo. This species has occurred several times previously at Scarborough. On March 10th another large spider, *Cupiennius sallei*, was also found amongst bananas. This is a very active spider which captures its prey by hunting, like our native Wolf Spiders. It also has occurred on many previous occasions. A large brown long-horned grasshopper found in foreign fruit early in May proved to be an immature example of a species of *Jamaicana*, a genus which occurs only in Jamaica. Adult examples of this species have been seen here amongst the bananas.—W. J. Clarke.

## YORKSHIRE NATURALISTS AT SKIPWITH.

The extensive Commons of Skipwith *cum* Riccall have always held an attraction for East Riding naturalists, and their wealth of insect, bird and marshland plant life has suffered less from change due to industrial development than any area of similar size in East Yorkshire. A meeting held at Skipwith on Saturday, 13th May, was well attended by representatives of all Sections, among which, perhaps, the ornithologists were most conspicuous. Thanks to the interested ownership of Mrs. Forbes Adams, the competent vigilance of the Head Keeper, Mr. Morris, the place is virtually a bird sanctuary, and Mr. Morris's guidance later in the day proved of inestimable value. The botanists and entomologists, under the leadership of Mr. R. D'Oyley Good, M.A., and Mr. T.

*Photo by*] **Horseshoe Lake, Skipwith Common.** [*S. H. Smith*

Stainforth, B.A., B.Sc., confirmed the presence of all the plants mentioned in the Circular (No. 375), but found insects rather scarce.

A meeting was held in the evening, at which the President (Mr. J. M. Brown, B.Sc.), occupied the chair. Reports were rendered by Messrs. H. B. Booth, R. D'O. Good, F. A. Mason, F. E. Milsom, C. F. Procter, S. H. Smith, the President, and Mrs. Morehouse. Thanks were accorded to the Local Secretary (Mr. C. W. Mason) and to Mrs. Forbes Adams for permission to visit her estates, as well as to Messrs. S. H. Smith, C. F. Procter, R. D'O. Good, T. Stainforth and Mr. Morris, all of whom had given valuable assistance in making the excursion a success.

Soil Conditions (Dr. J. Grainger) :—The soil over the whole area covered by the excursion seemed to be fairly uniform. It was very sandy and yet well supplied with organic matter, even where it was not definitely peat. Samples were taken down to a depth of 2 ft. All were uniformly acid (orange with B.D.H. Soil Indicator) and gave a red colour with potassium thiocyanate reagent, showing the presence of iron. The water which collected in pools was acid (reddish orange with soil indicator), and this fact probably accounted for the relative absence of aquatic vegetation in many ponds and ditches. The typical ochraceous-

coloured deposit of ferrous carbonate caused by the activities of iron bacteria was observed in a very acid ditch, thus showing that these organisms can tolerate appreciable acidity.

Vertebrate Zoology (C. F. Procter) :—The day was a very interesting one to the Vertebrate Section, as this common comprises a number of differently conditioned shallow ponds. On most of these the Black-headed Gulls have formed colonies, but they have been very wisely prevented from monopolising the whole of the available sites. The late Lord Wenlock unreservedly protected these beautiful birds in the later years of his life, and the effect of the absence of restriction was such that at one period they overshadowed all other bird life, and between 800 and 1,000 pairs, as far as could be judged, occupied the common. The little tussocky islets that were essentially favoured were quite inadequate for their needs, and they actually built along the narrow plank bridges and all round the edges of the ponds. At the present time, other species are given a chance, which is very much to the good of Skipwith Common as a bird sanctuary. The following birds were seen and reported :—

Black-head Gull, Mallard, Shoveller Duck, Teal, Coot, Water Hen, Carrion Crow, Rook, Jackdaw, Pheasant, Curlew, Redshank, Snipe, Ring Dove, Turtle Dove, Cuckoo, Green Plover, Swift, Swallow, House Martin, Thrush, Blackbird, Skylark, Chaffinch, Chiff-chaff, Whinchat, Sedge Warbler, Willow Warbler, Pied Fly-catcher, Tree Pipit. The Grasshopper Warbler was heard at Bishop Wood by some of the party who visited that place.

The keeper, Mr. J. Morris, reported that he had observed a pair of Pintail Ducks and that the Shelldrake and Pochard were on the common. He also reported that the Nightjar had arrived during the past week.

There was ample evidence of foxes and rabbits. One occurrence of the grass snake was reported, and the common lizard, *Lacerta vivipura*, was seen many times during the day.

Entomology (J. M. Brown) :—The visit was rather early in the season for adult Heteroptera to be about in great quantity, and beating was not very productive. From Scot's fir *Gastrodes ferrugineus* L. was obtained in some number, and from birch, a single *Elasmucha grisea* L. General sweeping yielded *Liocoris tripustulatus* F., *Monalocoris filicis* L., and *Stenodema calcaratum* Fall., while among the roots of heather occurred *Scolopostethus decoratus* Hahn., and on damp soil, *Acanthia saltatoria* L.

The Homoptera were represented by *Delphacodes pellucida* Fab., and *D. discolor* Boh. swept from grass.

*Hemerobius nitidulus* Fab., beaten from Scot's fir, was the only Lacewing noted, and *Limnophilus grisea* L. and *L. auricula* Curt. resting on birch, represented the Caddis-flies. A single species of Stone-fly, *Nemoura variegata* Oliv., was moderately numerous, and one example of Dragonfly, *Pyrrhosoma nymphula* Sulz., in teneral colouring, was handed to me by Mr. Bramley. *Elipsocus westwoodi* Mc.L. was plentiful on sallow.

To these notes Mr. H. Osteide contributes the following list of Coleoptera :—

*Cicindela campestris* L.
*Calathus cisteloides* Pz.
*Patrobus excavatus* Pk.
*Bembidium lampros* Hbst.
*Tachinus marginellus* F.
*Quedius fuliginosus* Grav.
*Philonthus fimetarius* Grav.
*Cytilus varius* F.
*Onthophiluis sriatus* F.
*Dolopius marginatus* L.
*Cyphon variabilis* Thunb.
*Phyllobius pyri* L.
*Anoplus plantaris* Naez.
*Orchestes salicis* L.
*Apion violaceum* Kirby.
*Rhynchites betulæ* L.
*Chrysomela staphylea* L.
*Lochmæa suturalis* Th.
*Chalcoides fulvicornis* Fabr.
*Adalia bipunctata* L.
*Coccinella 7-punctata* L.

Fungi (F. A. Mason) :—Comparatively few species of fungi were observed. *Daldinia concentrica*, the pyrenomycete, so frequently found on ash, was here found on birch, one small tree with a trunk about 2 in. in diameter, was found supporting a considerable number of fructifications. It is an interesting fact that at Allerthorpe, a similar district, in which small birches flourish, *D. concentrica* occurs on the same host. Mr. W. G. Bramley collected agarics, and although all the species are common they are worth mention as being characteristic of such an area : *Paxillus involutus, Tubaria furfuraceus, Omphalia umbellifera, Galera hypnorum* and var. *bryorum, Panæolus campanulatus* and *Stropharia semiglobata*.

The St. George's mushroom, *Tricholoma gambosum*, occurred sparsely distributed. Among some discomycetes collected by Miss D. Wooff were *Peziza luteo-nitens* B. and Br., and *Cilliaria hirta* (Schum.) Boud., both of which are additional to the flora of S.E. Div. (V.C. 61).

## REVIEWS AND BOOK NOTICES.

**A Physics Note-book. Heat, Light and Sound,** by **E. W. Tapper, B.Sc., A.K.C.** Methuen & Co., Ltd., viii.+100 pp., 2/-. A compilation of Physical Laws, Proofs, Formulæ, etc., which should prove useful for revision purposes for students and for those who want to get at the important facts of physics with as little trouble as possible.

**Economic Advisory Council Committee on Locust Control. The Locust Outbreak in Africa and Western Asia, 1925-31. Survey prepared by B.P. Uvarov, Senior Assistant, Imperial Institute of Entomology.** H.M.S.O., 5/-, postage extra. The title of this monograph will give all information necessary to those interested. There are excellent maps in a pocket at the end of the book and there are copious references to the literature of the subject.

**Field Book for the Shore Fishes of Bermuda,** by **William Beebe, Sc.D.,** and **John Tee-Van.** G. P. Putman's & Sons, xiv+337 pp., and 343 illustrations, 16/-. This book, published under the auspices of the New York Zoological Society, while ordinarily intended for tourists and fishermen, is suitable for those who may contemplate intensive work on life histories of Bermudan shore fish, and a useful book for all naturalists interested in ichthyology. Summarised descriptions are given of a very large number of species, and these are followed by over 50 pages devoted to Keys, compiled on the usual lines. An extensive bibliography is given at the end of the volume.

**British Birds : Volume XXVI, 1932-33,** by **H. F. G. Witherby.** The May number concludes the current volume which maintains the high standard one is accustomed to associate with this journal. The volume contains valuable articles on distribution, habits, etc., of many species, records of recovery of ringed birds, and notices of occurrence of rarities. One of the most valuable series of articles is that dealing with the enquiry into the Great Crested Grebe, conducted by T. H. Harrison and P. A. D. Holtom. The report, which has appeared during the year in four parts, has been reprinted and can be had from the publishers for 2/6 net.

**Cytological Technique,** by **John R. Baker.** Methuen's Monographs on Biological Subjects, pp. 126, 3/6 net. This excellent little book gives an account of the methods employed in fixing and staining animal tissues. Its interest lies especially in the fact that the author attempts throughout to explain the reasons for the various treatments employed. The result

is a surprisingly readable book incorporating a large amount of information. Although primarily written for work on animal tissues, its perusal is equally profitable to the botanist or zoologist, and it may be strongly recommended to those engaged in preparing histological specimens.

**Index to the Genera and Species of the Dratomaceae, Part I,** by **F. W. Mills.** Price 10/- per part. (Wheldon & Wesley, Ltd., 2-4 Arthur Street, London, W.C.2.) Mr. Mills' work on the diatoms is well known and he has at last been prevailed upon to publish an index to the species and genera. This will be invaluable to all serious students of this group. It gives references to all the taxonomic literature and descriptions of the various forms. The amount of work involved may be realised from the fact it comprises over 500 genera and 60,000 species and varieties. It is to appear in parts. The present part deals with the literature cited and with diatoms whose generic name begins with A.

**The History of the Entomological Society of London,** by **S. A. Neave,** assisted by **F. J. Griffin.** The Entomological Society, pp. 224, 10/6 net. The occasion of the centenary of the Entomological Society of London has been chiefly responsible for the production of this history by the Honorary Secretary, Dr. S. A. Neave, and the Registrar, Mr. F. J. Griffin. The rise and development of the society up to 1933 is traced, and the debt the society owed to Kirby, Westwood, Spence and others is clearly indicated. Other chapters deal with the collections, the library, publications, and finances. Not the least interesting part of the book is that devoted to brief biographies of distinguished fellows. The society has played so great a part in British entomology that this record of its history is both timely and valuable, and the society may be congratulated on its production.

**The Meaning of Animal Colour and Adornment,** by **Major R. W. G. Hingston.** Edward Arnold & Co., pp. 411, 18/- net. The ideas underlying this book might almost be termed a psychological theory of evolution. It is an attempt to evaluate the factors leading to differences in the colours and markings of animals. Major Hingston brings to his work a wealth of information which only a naturalist of his experience could acquire, and then presents it in clear and orderly fashion. He passes in review the colourations and markings of mammals, birds and insects, their songs and dances, and then concludes that the main differences between varieties and sub-species are associated with the different channels through which the animals give vent to hostile expressions. He points further to the frequent resemblance between hostile attitudes and expressions and those of courtship. As a result of this outlook the author develops the conclusion that conditions permitting the removal of fear allow of the development of methods of hostile expression and are correlated with the development of new varieties or races, marked by intensification of the markings or forms exhibited during the expression of anger. Many of the examples quoted in illustration of this argument find a much better explanation in these terms, than, for example, in terms of the theory of protective colouration. While it is impossible to summarise the wealth of illustration given, the author finds good support for his thesis in the Eastern birds he has studied. Another particular example he employs is the case of the development of the various breeds of pigeon from the rock pigeon. Thus the trumpeter has developed hostile expression through the vocal channel, the fantail in its feathers, and the pouter in its breast expansion. The author may be congratulated on having produced an eminently readable book in developing his argument, and one which is certain to arouse considerable interest among naturalists.

*1933 July 1*

## NEWS FROM THE MAGAZINES.

*Science Progress* for April, 1933, summarises recent advances in science, and has articles, essays and reviews of recent scientific literature.

*The Scottish Naturalist* for May and June has articles on ' Changes of Distribution of British Grey Geese ' ; ' Notes on the Status of Birds in Scotland in 1932 ' ; ' Some Observations on the Nesting Habits of the Blackbird ' ; ' A Rare Shark New to Scottish Waters ' ; and ' Some Perthshire Diptera.'

*The Journal of the Ministry of Agriculture* (April and May numbers) contains numerous articles on agricultural problems and practice. The April number has an interesting contribution from Mr. W. B. Alexander, Director of the Oxford Bird Census, on ' A Census of House Martins : Are their numbers decreasing ? ' This article should be read by all ornithologists, and others interested in methods of estimating density of avian population.

*The British Mycological Society Transactions*, Vol. XVII, Part IV, 18th March, 1933. This issue is to hand and it contains valuable articles of both biological and systematic importance, including ' The British Species of the Genus *Diaporthe* Nits. and its Segregates,' by L. E. Wehmeyer, and ' A Contribution to the Life-History of *Sordaria fimicola* (Four-Spored Form), with Special Reference to the Abnormal Spores,' by Winifred M. Page. Dr. C. L. Shear contributes an article on ' The Manuscript of James Bolton's *Icones Fungorum circa Halifax Sponte Nascentium*.' and J. Ramsbottom supplies an ' Index to Berkeley and Broome's Notices of British Fungi.' This number also includes the Index to Vol. XVII ; it is published by the Cambridge University Press, London, price 7/6.

The June number of *The Journal of the Ministry of Agriculture* contains several articles of interest to naturalists. W. P. Pycraft has a very useful contribution on ' The Kestrel,' the information being arranged under the following headings : Description and Habits, Food of the Kestrel, Value to Agriculture. It is to be hoped that these records will be read by many farmers, landowners and keepers. A short extract from the article will give some indication as to the line taken by the author : ' Had the diet of the Kestrel, and the other falcons mentioned, been better understood, they would not in the past have been regarded as " vermin " and relentlessly destroyed for alleged ravages on game-preserves. Among the more understanding estate owners and experienced gamekeepers, it is realised that the policy of extermination is not justified ; and, where a more enlightened attitude prevails, Kestrels have been allowed to nest in the immediate neighbourhood of the coops where pheasant chicks were being reared, and seldom has a chick been taken. The Kestrel's real attraction to the rearing-field is furnished by the mice which gather there to eat the scattered grain. On rare occasions, probably because other food was scarce, or, accidentally in mistake for normal prey, a chick may have been snatched up, but there has been little foundation for the charges of havoc wrought among chicks of hand-reared game. A Kestrel, having taken a chick, may develop a liking for them and make repeated visits, but, where an understanding attitude prevails, the marauder is regarded as a " rogue " and shot, and no complaint can be made about putting an end to such depredations.'

*The Entomologist* for June contains articles on ' A Possibly Extinct New Zealand Mayfly,' by M. E. Mosely (with plate) ; ' The Light Trap as an Adjunct to the Exploration of a Fauna,' by R. Adkin ; ' New Species of Notiobiella from Africa and Seychelles (*Neuroptera hemerobiidæ*),' by D. E. Kimmins ; ' Rhopalocera of the Mullet Peninsula, Co. Mayo,' by S. B. Hodgson ; ' Notes on *Braconidæ alysiides*,' by C. Morley ; and numerous short notes and observations. Among the species noted by Morley are *Chasmodon apterus* Nees., from Barnard Castle, and *Alloea contracta* Hal., from Bubwith, East Yorks.

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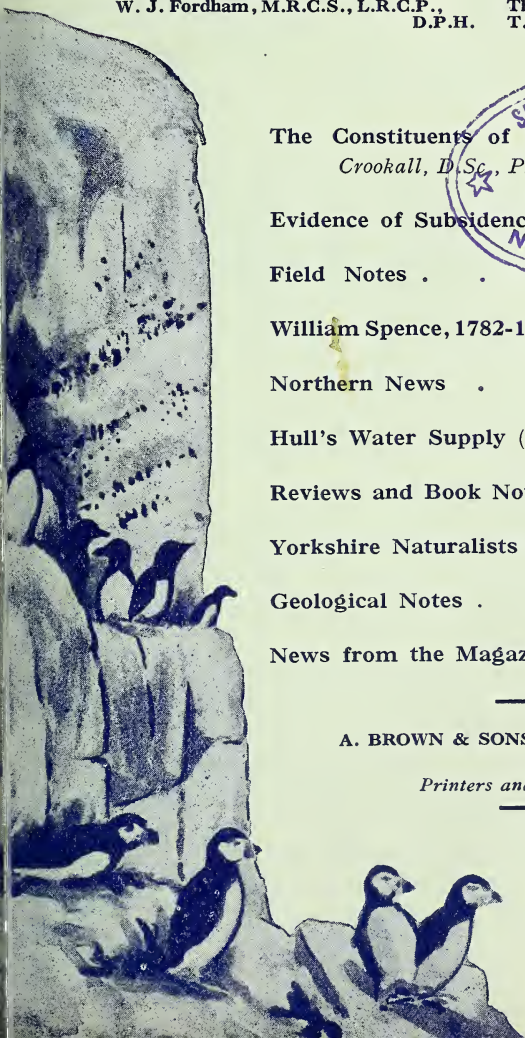

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# THE CONSTITUENTS OF BANDED HUMIC COALS.

R. CROOKALL, D.Sc., PH.D.

THE complex nature of humic (so-called bituminous) coals long militated against research into their chemical constitution and biological composition, and therefore against an understanding of their behaviour under various conditions and their most economic utilisation.

One of the most important steps in the study of such fuels consisted in the recognition, by Dr. M. C. Stopes,[1] that they are composed of four types of visible ingredients. These types were designated vitrain, clarain, durain and fusain.

Dr. Stopes' classification has been subjected to some criticism, and other classifications, based on different criteria, have been proposed. Nevertheless, the separation of vitrain, clarain, durain and fusain from samples of coal and their investigation individually has yielded results of the first importance. The results have been of value both in the understanding of humic (and other) coals from a scientific point of view and in their practical employment as fuels, etc. The literature describing these investigations of the four visible ingredients has reached considerable proportions and the writer has summarised, in the form of the accompanying Table (pp. 171-173), the chief facts concerning them.

Miners long ago recognised in humic coals (*a*) bright coal ('softs'), (*b*) dull coal ('hards') and 'mother of coal' or 'mineral charcoal.' It remained for Dr. Stopes satisfactorily to define these, to indicate the presence of a fourth ingredient (vitrain) and to call attention to the importance of investigating the constituents separately. In collaboration with Professor R. V. Wheeler,[2] Dr. Stopes has published the results of numerous researches into their nature, while other workers have brought to light many important facts.

The methods by which vitrain, clarain, durain and fusain have been investigated include chemical analysis, resolution by solvents, oxidation by various agents and microscopic examination. The ingredients showed differences in behaviour of greater or lesser extent, so that it is now possible, from a mere visual inspection of a particular coal, to deduce certain of its properties and its suitability to certain purposes. For example, the readiness with which a particular coal 'cakes'

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1 Stopes, M. C., 'On the Four Visible Ingredients in Banded Bituminous Coal,' *Proc. Roy. Soc.*, B. Vol. 35, 1919, pp. 470-487.

2 Stopes, M. C. and R. V. Wheeler, 'Monograph on the Constitution of Coal,' Dept. of Scientific and Industrial Research, *London*, 1918; 'The Spontaneous Combustion of Coal in Relation to its Composition and Structure,' *Fuel*, Vol. 2, pp. 29-41, 83-92, 122-132; 'The Constitution of Coal,' *Fuel*, Vol. 3, pp. 3-11, 63-67, 97-105, 129-133, 179-184, 196-204, 254-261, 288-297, 328-335, 356-360, 393-399, 439-452.



AUG

on heating, an essential feature in the production of large pieces of compact coke suitable for metallurgical purposes, depends on the presence of vitrain (and clarain). From the physical point of view, the durain and fusain present act as ' inert ' material which is bound together by the fusion of the bright coal. Apart from special preliminary treatments, therefore, coals required for coking purposes must contain a sufficient proportion of vitrain and clarain. On the other hand, a coal may fuse so readily that it is advantageous to blend it with a certain proportion of coal which is richer in durain and fusain. Again, inferior coals may be pressed into service by blending.

The following brief notes may be given in explanation of the Table :—

(1) The terms vitrain, clarain, durain and fusain are based on the macroscopic physical characters of the ingredients. Thiessen's terms, anthraxylon and attritus, are based upon the origin of the material which went to form the ingredients. With the exception of fusain, Thiessen's terms are not strictly equivalent to Dr. Stopes' terms as here shown. Anthraxylon represents coaly matter derived from botanically homogeneous and attritus from botanically heterogeneous debris. Fusain is usually, though not invariably, composed of homogeneous material ; durain is always of heterogeneous origin ; clarain is usually heterogeneous ; vitrain commonly, but not always, homogeneous. A lenticle of vitrain often represents a single plant fragment, but sometimes consists of the remains of miscellaneous tissues.[1]

(2) As was first pointed out by Dr. John Pringle,[2] the coaly layer investing stems fossilised in shales and in sandstones always consists of vitrain.

(3) The term ' dice ' applies chiefly to vitrain (which tends to break up into small dice-like cubes), but clarain has also been included under the name.[3]

(4) Glanzkohle may also refer to anthracite.

(5) Clarain forms the bulk of most British seams of humic coal. The distinction originally drawn between vitrain (as structureless) and clarain (as containing plant structures, visible in thin sections under the microscope) has now broken down (see below). The great similarity between vitrain and the brighter clarains in chemical composition and properties

---

1 Seyler, C. A., ' Banded Bituminous Coal,' *Fuel*, Vol. 5, 1926, p. 182. Thiessen, R. and W. Francis, ' Terminology in Coal Research,' *ibid.*, Vol. 8, 1929, p. 385.

2 Pringle, J., ' On the Origin of Bright Laminae in Coal,' *Trans. Edinb. Geol. Soc.*, Vol. X, 1911, pp. 30-37. Lomax, J., *Colliery Guardian*, Vol. 129, pp. 514-516.

3 Gresley, W. S., *Trans. Manchester Geol. Soc.*, Vol. 21, 1892, p. 520.

## LITHOLOGICAL INGREDIENTS IN BRITISH HUMIC COALS.

| *British Terms.* | *Vitrain.* | *Clarain.* | *Durain.* | *Fusain.* |
|---|---|---|---|---|
| Popular terms | bright, glance or glanze coal ; softs ; ' dice ' (Some bright clarains contain 90% or more vitrain : some dull clarains contains a large proportion of durain). | | hards ; bone | mother of coal ; ' mineral ' charcoal |
| German terms | Glanzkohle (bright coal) ; ' structureless '— euvitrit ; with structure— provitrit vitrit | | Mattkohle (dull coal) ; (includes some clarains with disseminated durain which cannot be placed in vitrits); durit | Faserkohle (fibrous coal) ; soft—Staubfaserkohle ; hard—Hartfaserkohle ; fusit |
| Thiessen's terms | anthraxylon (often definite fragments of wood or periterm) | attritus (generally miscellaneous tissues) | | anthraxylon (definite woody fragments) |
| Average % in British seams | 1—20 | 30—99 | 1—50 ; very variable, | 1—10 ; av. 2·5 |
| Physical properties | bright, glassy, not streaked ; homogeneous to the naked eye | bright and silky, but not glassy ; streaked | granular ; hard ; compact ; dull black ; heavy | soft ; black ; charcoal-like ; soils the fingers |
| Extent of lenticles (*a*) vertical (*b*) lateral | seldom more than $\frac{1}{2}$ in. usually small | 1/16 to 3 ins. often great | $\frac{1}{8}$ to 4 ins. often great | usually 1/16 to $\frac{1}{8}$ in., but up to 1 in. usually a few inches |
| Fractured surface | conchoidal | straight | irregular ; granulated | irregular ; powdery ; |
| Contact surface with other ingredients | well defined | not well defined (see durain) | not well defined : interlocks, chiefly with clarain | well defined |
| General chemical composition | high in hydrocarbons and in ulmins | high in hydrocarbons and in ulmins | next to fusain in % of carbon ; high in ' resins ' | % of carbon high ; % of oxygen and hydrocarbons low |
| Moisture present | high (*e.g.* 9·9%) | fairly high (*e.g.* 8·6%) | fairly low (*e.g.* 6·0%) | low (*e.g.* 3·1%) |

**LITHOLOGICAL INGREDIENTS IN BRITISH HUMIC COALS**—(*Contd.*)

| | *Vitrain.* | *Clarain.* | *Durain.* | *Fusain.* |
|---|---|---|---|---|
| Example of proximate analysis : | | | | |
| volatiles (%) | 29·43 | 29·91 | 29·74 | 16·87 |
| fixed carbon (%) | 59·77 | 60·19 | 56·46 | 66·23 |
| C/H ratio | 15·10 | 15·12 | 16·69 | 22·71 |
| ash (%) | 0·90 | 1·30 | 7·80 | 13·80 |
| Example of pyridine-chloroform analysis : | | | | |
| *alpha*-compounds | 65·8% | 72·8% | 78·4% | |
| *beta*-compounds | 25·0% | 19·0% | 13·0% | ? |
| *gamma*-compounds | 9·2% | 8·2% | 8·6% | |
| Oxidation with nitric acid | forms a large froth which settles slowly to form a black solution from which no debris settles | froms a small froth and a black solution from which debris settles (chiefly clear brown fragments—cuticles and parts of spores ; also black opaque fragments) | forms no froth ; solution paler than that of clarain ; much debris settles from it (chiefly black opaque fragments, with clear parts—walls of mega-spores) | forms no froth and no true solution, but a liquid from which a large amount of debris settles (black angular fibrous particles) |
| Oxidisability with potassium permanganate | vitrain and clarain : 615 cc. oxygen per grm. | | 632 cc. oxygen per grm. | 69 cc. oxygen per grm. |
| Products of destructive distillation : | | | | |
| coke (%) | 65·7 | 65·4 | 62·3 | 80·3 |
| tar (%) | 7·7 | 8·9 | 12·1 | 3·6 |
| liquor (%) | 8·0 | 7·5 | 5·9 | 4·8 |
| gas, cc. per 10 grm. | 3,465 | 3,390 | 3,280 | 2,400 |
| oil (soluble in ether) by hydrogenation | ? | 56·2% of oil soluble after 3 hours' treatment | 37·5% of oil soluble after 4 days' treatment | 95% of fusain remained insoluble after 4 days |
| Example content of | | | | |
| (*a*) ulmins | (*a*) 96% | (*a*) 82% | (*a*) 83% | (*a*) 20% |
| (*b*) organised plant tissues | (*b*) nil | (*b*) 5-10% (chiefly cuticles ; some spores) | (*b*) 15-25% (spores and cuticles, with some wood) | (*b*) 70-80% (wood or fibres) |
| (*c*) 'resins,' etc. | (*c*) 0·5% or less | (*c*) about 0·4% | (*c*) high % | (*c*) nil |

**LITHOLOGICAL INGREDIENTS IN BRITISH HUMIC COALS**—(*Contd.*)

| | *Vitrain.* | *Clarain.* | *Durain.* | *Fusain.* |
|---|---|---|---|---|
| Liability to spontaneous combustion | Large ulmin content and fragile—hence has the greatest tendency to spontaneous combustion | Large ulmin content favours but fairly hard nature operates against spontaneous combustion | Small ulmin content and hard nature are against spontaneous combustion | Porosity favours oxidation and therefore spontaneous combustion |
| ' Caking ' properties and type of coke | vitrain and clarain fuse and ' cake ' at ' low ' temperatures —an essential to the formation of large pieces of compact coke ; the coke of vitrain is very porous and swollen, that of clarain more compact and less swollen | | non-caking (unless hydrogenated) ; coke usually powdery ; a ' free burning ' fuel (for steam-raising, etc.) | non-caking ; coke usually powdery ; calorific value high—a valuable powdered fuel |
| Absorption of water vapour : 1 day 2 days 4 dzys | 20·3% 21·2% 23·5–24·3% | | 9·1% 10·0% 11·3–12·5% | 4·9% 5·2% 5·9–7·0% |
| Ash present (see also proximate analysis, above) | least ; mainly or wholly derived from the plant tissues ; calcium sulphate and much magnesia and alkalis ; low in silica and alumina | little ; mainly or wholly derived from the plant tissues ; calcium sulphate and much magnesia and alkalis ; low in silica and alumina | generally largest ; includes much silica and alumina ; low in magnesia and alkalis ; largely represents detrital mineral matter | often large ; varies in amount and composition ; crystalline matter, especially calcium compounds from percolating solutions, may be present |
| Biological contents (seen in thin slices, etc.) | pseudomorphs of wood and fibres only seen ; cells are completely disorganised, forming ulmic acid | chiefly cuticles, some spores, fragments of wood and soft tissues, embedded in ulmic acid | chiefly spore-cases and cuticles of leaves ; cell cavities filled with ulmic acid | Crushed carbonised wood—and fibre—cells, with empty cavities |
| Deductions as to conditions under which remains decayed | under water | under water | under water | at surface of water |
| Deductions as to accumulation of debris | mainly *in situ* | mainly *in situ* | mainly by drift | mainly *in situ* |

suggests, for most practical purposes, a classification into (*a*) bright coal, (*b*) durain, and (*c*) fusain. On the other hand, if the view of Bode[1] and others that clarain consists of an intimate mixture of vitrain and durain be adopted, the classification is (*a*) vitrain, (*b*) durain, and (*c*) fusain. As fusain mainly consists of free carbon, there are virtually only two coal-types.[2]

(6) The example of the moisture content refers to the Top Hard Coal.[3]

(7) The example of the pyridine-chloroform analysis is from the work of Dr. Stopes and Professor Wheeler.[4] As the amounts of the *gamma*-compounds are approximately the same, the chief differences between durain, clarain and vitrain, as revealed by this analysis, lie in the *alpha*—and *beta*—compounds. These two groups of compounds are very similar to each other. They are (*a*) infusible, (*b*) yield but little liquid products (and mainly phenols) on distillation, (*c*) the gases yielded on distillation are mainly hydrogen and the oxides of carbon. *Gamma*-compounds (*a*) melt at 95-100 degrees C., (*b*) on destructive distillation yield about half their weight of liquid products (mainly ' resinic ' and containing no phenols), (*c*) on distillation yield as gases mainly the paraffin hydrocarbons. It is chiefly the *gamma*-compounds (ulmo-humic acids) which confer coking properties on a coal, though coking is not entirely referable to them. Dr. R. S. Illingworth considers that to yield a coherent coke, a coal should contain not less than 5 per cent. of *gamma*-compounds with a C/H ratio of not less than 10.

(8) In oxidising the ingredients by nitric acid, concentrated acid, with a few drops of hydrofluoric acid, is applied to the sample and left from two to seven days. The reactions which have occurred become apparent after (*a*) neutralisation with potassium hydroxide and (*b*) the addition of water.[5]

(9) The example of the ulmin contents are from the work of Francis and Wheeler.[6] Vitrain was originally regarded as structureless, as, indeed, it appears to the naked eye and even under the lens. Structureless vitrain (' euvitrit ' in

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[1] Bode, H., ' Zur Nomenklatur in der Kohlenpetrographie. Kohle u Erz,' Vol. 18, 1928, pp. 699-710.

[2] Thiessen, R., *Journ. of Geol.*, Vol. 28, 1920, p. 185. Evans, M. M., L. Slater and R. V. Wheeler, 'On Vitrain,' *Fuel*, Vol. 8, 1929, p. 30. Winter, H., *Glückauf*, Vol. 63, 1927, p. 483.

[3] Winter, H., ' Banded Coal,' *Fuel*, Vol. 7, 1928, p. 52.

[4] Stopes, M. C. and R. V. Wheeler, *Fuel*, Vol. 2, 1923, p. 88.

[5] Stopes, M. C. and R. V. Wheeler, *Fuel*, Vol. 2, 1923, p. 40. Hendrickson, A. V., *ibid.*, pp. 103, 156.

[6] Francis, W. and R. V. Wheeler, ' The Spontaneous Combustion of Coal : the Most Readily Oxidisable Constituents,' *Safety in Mines Research Board*, Paper No. 28, 1926. See also Moore, B., *Fuel*, Vol. 10, pp. 205-211.

contrast to ' provitrit ') is, however, now known to be rare, if existent. When polished and etched surfaces of vitrain are examined by reflected light, most specimens show pseudomorphs of plant cells. It is possible, by regulating the oxidation and removing the soluble ulmins by means of dilute sodium hydroxide, to see and photograph the more obvious structures, but the pseudomorphs disappear as the ulmins dissolve. The structures cannot be separated and retained as can (from durain, etc.) spore-cases, cuticles, fibres and tracheids. The only plant-residues in vitrain are rodlets of ' resins.' [1]

(10) The adsorption of water vapour, in cases in which the oxygen content of a coal is less than 10 per cent., runs parallel to the oxygen content.[2]

(11) The deductions, shown in the Table, that vitrain, clarain and durain are mainly formed under water are generally, though not universally, accepted.[3] For example, Taylor observes, 'The roofs of the bituminous coal seams, ranging in age from the Carboniferous to recent, have two characteristics in common: (*a*) they are alkaline; and (*b*) they contain replaceable sodium in excess of replaceable calcium. . . . Bacterial decomposition of vegetable matter can take place under such a roof, and results in the formation of solid reduction products, one of which is fusain.'

(12) The oxidisability with dilute potassium permanganate cited is due to Kreulen.[4]

(13) The examples of figures obtained from destructive distillation of the ingredients are due to Greenwood.[5] Amounts from the true sample of coal were: coke, 66.8 per cent.; tar, 8.9 per cent.; liquor, 7.5 per cent.; gas, cc. per 10 grm. 3,100.

(14) The example of the amounts of oil obtained by hydrogenation is due to Shatwell and Graham.[6]

(15) Professor Hickling[7] has pointed out that *vitrain and*

---

[1] Hickling, H. G. A. and C. E. Marshall, 'The Microstructure of the Coal in certain Fossil Trees,' *Trans. Inst. Mining Eng.*, Vol. LXXXIV, 1932, p. 13. Seyler, C. A., *Fuel*, Vol. 5, 1926, p. 56. Stopes, M. C. and R. V. Wheeler, *Fuel*, Vol. 2, 1923, p. 122.

[2] Lea, F. M., *Fuel*, Vol. 7, 1928, p. 433.

[3] The following writers are in disagreement:—
Stuart, M., 'The Geology of Oil, Oil-shale and Coal,' *London*, 1926, p. 21. Taylor, E. M., *Fuel*, Vol. 7, 1928, pp. 66-71, 127-134, 327-8. Buchler, F., *Glückauf*, Vol. 65, 1919, p. 161.

[4] Kreulen, D. J. W., *Brennstoff-Chem.*, Vol. X, 1929, p. 397.

[5] Greenwood, H. D., 'Examination of the Banded Constituents of a Derbyshire Coal,' *Trans. Soc. Chem. Ind.*, Vol. 43, 1924, pp. 363-366.

[6] Shatwell, H. G., and J. I. Graham, 'Hydrogenation and Liquefaction of Coal,' *Fuel*, Vol. 4, 1925, pp. 25-30.

[7] Hickling, H. G. A., 'The Geological History of Coal,' *Fuel*, Vol. 10, 1931, pp. 212-232.

*fusain* are sufficiently definite and uniform to be described as true *constituents* of humic coal, but that *clarain and durain* are not definite uniform constituents ; they are aggregations of different materials and are therefore *types of coal aggregates* rather than constituents.

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## EVIDENCE OF SUBSIDENCE AT HULL.

I HAVE had an enquiry as to whether there is any evidence of the area round the City of Hull having subsided in comparatively recent times. The peat beds under Hull indicate that there have been changes in level in early times, but it occurred to me that possibly the weight of the enormous number of houses and other buildings to meet the demands of a population of nearly 350,000 may have caused some slight depression. It will be borne in mind that the area upon which Hull is built is old Humber silt, and beneath it the spongy peat beds still cause plates to rattle and windows to shake when heavy traffic pass along the roads. It occurred to me that Mr. A. Tulip, Chief Engineer for Docks at Hull, might have some information on the point, and I therefore wrote him on the matter. He gives the following information which I think should be recorded : ' There is no direct data in this office with regard to local subsidence due to the causes you mention, but there appears to be evidence that in certain localities of the British Isles, other than colliery districts, surface movement has occurred since the ordnance survey in 1888. This fact specially came to my notice in 1929 when using the revised ordnance surveys which were published about 1926, whereon the levels are reduced to the Newlyn datum instead of the Liverpool datum adopted in the previous surveys. Certain discrepancies were apparent after the various levels were adjusted to the new datum, and I wrote to the Director General of the Ordnance Survey Office with regard to these. I was specially concerned at this time with the Hedon Road (East Hull) district, and from information supplied there appears to have been a subsidence of the building on which the bench mark was cut of 0.186 feet between 1888 and 1908, and a further settlement between 1908 and 1926 of about 0.1 feet. Similar figures occur at other bench marks. This sinking, however, is not necessarily consequent upon the vibratory effect of heavy traffic, as same of the bench marks are not in the close vicinity of high roads carrying heavy traffic.' The shrinking of the clay subsoil due to drainage may be a factor.—T.S.

## FIELD NOTES.

**Nightingale Nesting near York.**—A pair of nightingales successfully reared four young ones, which left the nest on June 12th. The nest was a fairly large, loose structure, composed of dead beech and rhododendron leaves with the addition of a few fine grasses, and was situated on the ground among some elder sticks and common nettles on the edge of a dark shrubbery at Waplington, fifteen miles east of York. Owing to the bad light some photographs of both parents feeding the young birds failed, and the young had flown away before a second effort was possible.—S.H.S.

**Snake Pipefish at Scarborough.**—On February 28th, after a rough sea, a Snake Pipefish (*Nerophus æquoreous*), measuring 21 in. in length, was washed ashore in the South Bay near the bathing pool. This is the largest of the six British species of these fishes, and is by no means of common occurrence. It can be distinguished from the Great Pipefish, the next largest, by its oval section, by the bluish white transverse lines which ring the body at short intervals, and by the absence of the pectoral and caudal fins. It is now preserved in the Scarborough Museum.—W. J. Clarke.

**The Flowering Period of the Barren Strawberry.**—The Barren Strawberry (*Potentilla fragariastrum*) is invariably the first of our plants to flower in the neighbourhood of Douglas, Isle of Man. For the last seven years it has appeared on November 28th, 1926 ; November 25th, 1927 ; December 2nd, 1928 ; October 21st, 1929 ; August 15th, 1930 ; September 8th, 1931 ; and October 11th, 1932. This gives the average date of flowering as October 20th. It should be mentioned that these dates are not those of out-of-season appearances, *e.g.* September violets, but that flowers have been found in every month from these dates each year. The August record is an early and not a late date as no flowers were observed on this wall in July and the same plant continued to flower throughout September. From these dates it would seem that the flowering period of the Barren Strawberry is much underestimated by most text-books, and that a conservative estimate would be from November to May. Near Douglas it is generally common in December, while late flowers are to be found until the middle of June. July is the only month in which I have never found it in flower.—W. S. Cowin.

# WILLIAM SPENCE, 1782-1860.

FRANCIS J. GRIFFIN, A.L.A.
*Registrar, Royal Entomological Society of London.*

In view of the lack of information regarding the descent of William Spence, F.R.S., co-author of the celebrated ' Introduction to Entomology ' with W. Kirby, the following additional details, very kindly supplied by Rev. E. C. Ruthven-Murray, of Bishop Burton, Beverley, E. Yorkshire, may be of interest :—

*Extract from Register of Baptisms, Bishop Burton.*

" 1782, October 1st. William, son of Robert Spence, Husbandman, by Anna his wife, baptized.'

*Inscription on a flat tombstone in the churchyard at Bishop Burton.*

' Elizabeth, wife of William Spence, Esquire, F.R.S., London. Died April 5th, 1855, aged 75 years. Also of the above-named William Spence, Esquire, F.R.S., who died in London, January 6th, 1860.'

The Rev. Ruthven-Murray kindly adds the following additional information :—

' His father, Robert (who had three brothers and two sisters) was baptized 1753, but was not buried here. His mother was buried here 1820. His grandfather, Robert, was baptized here 1710, but buried from Elton, 1780. His grandmother, Lydia (*nee* Johnson), was baptized here 1716 and buried 1805. This Robert had one sister. His great grandfather, William, must have come here with his parents, William and Mary (William was buried 1702), before 1692 when a sister was baptized. He married here 1708 Elizabeth White and was buried 1723. He had one brother and five sisters ; also a cousin, William, who left descendants resident here till 1829. W. S. himself had an elder brother, Joseph, whose son, James, was the last of the family to be buried here (1870). By the way, all the Spences seem to have been farmers.'

An excellent account of Spence, with a portrait, was published in 1906 by Mr. T. Sheppard in *Trans. Hull Sci. Field Nat. Club*, III, 285-290.

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On his arrival back from the West Indies, Mr. T. Sheppard had a welcome communication from the Secretary of the Linnean Society of London, informing him that at their recent Annual Meeting he had been elected an Associate of that Society. The number of Associates is limited to twenty-five, and these can only be elected when a vacancy occurs in the list. According to the Bye-laws of the Society, this Associateship is only awarded to those ' Whose work as a naturalist deserves honourable recognition.' Mr. Sheppard understands that his work for *The Naturalist* was one of the reasons this honour was conferred upon him. He has all the privileges of the Fellows of the Society and will in future receive the publications issued.

## HULL'S WATER SUPPLY.

In *Ours*, the magazine of Messrs. Reckitt & Sons, for February, is an article on ' Modern Water Works : A Suggested New Water Supply

**Farndale, to-day.**

**The Suggested Farndale Reservoir.**

for Hull,' by Mr. T. H. Jones, the Deputy Water Engineer. In this he illustrates the suggested source of supply, namely Farndale as it is at present and also as it will be if the Reservoir Scheme is carried out. These two views we are kindly permitted to reproduce by permission of the Editor of *Ours*.—T.S.

## REVIEWS AND BOOK NOTICES.

**The English Names of our Commonest Wild Flowers,** by **R. Fisher.** Arbroath : T. Buncle & Co., pp. 249, 3/6 net. Canon Fisher's work on the wild flowers of the Whitby district is so well known to northern botanists that the publication of his book will be received with particular pleasure. The present work is perforce limited to the English names of the plants present in all the 112 comital districts into which the country is divided. We may hope that in due course the remainder of the 17,000 names in the original manuscript may appear in publication. To the materialist, the utility of having an excellent book of reference to the common English plant names will no doubt commend the book. But Canon Fisher's work may also serve as a timely reminder that there are flowers of the language as well as flowers of the field, for many of the names he has collected are as charming as the plants to which they belong. To many readers the most fascinating part of the present volume will be the manner in which clues are constantly given as to the origin of the names. These are of great interest, especially as other sources of information in this field are not readily available. While no one can expect the English names to replace the Latin ones for scientific purposes, yet the popular names are, after all, the ones which appeal to most people. A knowledge of their origins and meanings should undoubtedly stimulate our interest in the plants themselves as it will certainly increase our pleasure in their pursuit.

**Mosses of Hong Kong, with other Chinese Mosses,** by **H. N. Dixon,** *Hong Kong Naturalist.* Supplement No. 2, March, 1933, pp.1-31, and two plates. This paper, intended to form a basis for a complete account of the bryology of Hong Kong, originated in collections made by Dr. G. A. C. Herklots ; but more extended expeditions in Kwangtung and Fukien, and material received from Rev. E. Licent, Miss D. Wheldon and several other sources, induced the author to widen the scope. Twenty-nine species new to science are described, and eighteen others are newly recorded, bringing the total of Chinese mosses to 1,125. Read in conjunction with a paper published by Dr. H. Reimers in Hedwigia in 1931 (Bd. LXXI, pp. 1-77, 24 text fig.) there is now available a concise account of what is known to date of Chinese mosses, to stimulate interest in this branch of natural history, already great in Japan and appreciable in China. Dr. Herklots, who is a member of the Yorkshire Naturalists' Union, is to be congratulated on this, one of several similar activities, and on having secured the help of so eminent a bryologist as Mr. Dixon for the description of the material. Specimens of the mosses are in the Herbarium of the University of Leeds.

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*The Entomologist's Record* for May contains ' An Account of My Studies in the Biology of *P. rapæ*,' by Orazio Querci ; ' Lepidoptera at Maurin, Basses Alpes,' by A. E. Burras, W. P. Curtis and W. Fassnidge ; various notes on collecting, etc., and the continuation of the supplement ' British Noctuæ,' by H. J. Turner.

*The Entomologist's Monthly Magazine* for June contains ' More New and Little-known British Thrips,' by R. S. Bagnall ; ' *Neuraphes elongatulus* Mull et Kunze ab *glabricollis* Machulka, an Aberration New to Britain,' by H. Donisthorpe (from under spruce bark at St. Albans) ; ' Two Ichneumon Parasites of *Lophyrus pini* Klug.,' by W. B. R. Laidlaw (with plates of *Lamachus pini* Bridg. var. *caledonicus* Laidl., and *Holocremna macellator* Thnbg. var. *cothurnata* Holmg. from Scotland) ; ' The Insect and Allied Fauna of Cultivated Mushrooms,' by M. D. Austin ; ' Meigen's Nouvelle Classification, 1800,' by E. R. Goffe ; and short notes on Coleoptera and Proctotrypidæ.

# YORKSHIRE NATURALISTS AT DENT.

Dent was the Headquarters of the Yorkshire Naturalists' Union during Whitsun weekend, June 3rd to 5th, and although it is the second visit in recent years, the possibilities of discovery in any one of the branches of natural history covered by the Sections have by no means been exhausted. A very full and representative gathering of members and associates had assembled by the preceding Friday evening, including the President (Mr. J. M. Brown, B.Sc., F.L.S.). The weather was glorious, with the temperature higher than normal for June, which, although satisfactory for the entomologists and slow-going mycologists, was rather exacting for more strenuous work. The 'George and Dragon' as on previous occasions proved comfortable and commodious Headquarters.

Monday was devoted to the investigation of the River Dee and its banks upstream from Dent Bridge, under the guidance of Mr. Chris. A. Cheetham. The Union was pleased to have as visitors members of the Sedgwick Society from Sedbergh, piloted by Mr. R. W. Gray. A strong spirit of natural history investigation is fostered at Sedbergh, very largely, we believe, by the Rev. A. J. K. Martyn, whom we should have been glad to have had with us, had his duties not prevented his attendance.

Although there was no fixed routes for Sunday small parties made for themselves routes, which included Colm Scar, Gawthrop and the woods in the neighbourhood, and Flinters Ghyll, and in that way a good deal of useful collecting was done.

Helmside Ghyll was the rendezvous for Monday, Mr. Cheetham again acting as guide and a very full day was spent with satisfaction to all. It will be seen from the reports which follow that many valuable observations were made, although the problems of the plant life of the district in relation to its geology should have whetted the scientific appetite for still another visit to this charming dale.

A meeting was held on Monday evening under the chairmanship of the President. There was a long and animated discussion of the week-end work, and it warranted the change of time from before dinner to after dinner, although it was greatly regretted that it prevented day visitors from the West Riding taking part in it. The leaders of Sections who reported at this meeting were the President, Messrs. Chris. A. Cheetham, W. F. Fearnley, F. A. Mason, Mrs. E. M. Morehouse, Messrs. E. F. Milsom, A. Malins Smith, W. E. L. Wattam, W. P. Winter and Dr. W. A. Sledge. A hearty vote of thanks was accorded to the Local Secretary (Mr. J. Hartshorn) coupling with it Mr. Chris. A. Cheetham, who had devoted much attention to the arrangements as well as officiating as leader.

Vertebrate Zoology (W. F. Fearnley) :—Mammals observed include a Badger seen by the railway side in the early morning, a Red Squirrel in Helmside Ghyll, and Rabbits. An interesting sight was afforded by a domestic cat wading in the river whilst stalking Rabbits on the bank. Trout appeared to be fairly abundant in the River Dee.

Thirty-four species of birds were noted, and the nests or young were found in the case of fifteen. Song Thrushes, Blackbirds and Redbreasts occurred in the woods and gardens. Starlings were seen carrying young horse-chestnut leaves into their nests. Meadow-pipits were feeding young on the hillsides, and Tree-pipits were common in the valley. The Wren was quite common, and a nest containing eggs was found. Dippers were met with at intervals along the River Dee, The House-sparrow appears to be as abundant here as in most places, although we were told that forty years ago there were none in Dent. Chaffinches

were not numerous, just a few being seen and one nest found. A Bullfinch was seen close to the village. Yellow Wagtails were observed on the roadside a little below Dent. A Whitethroat was seen by the riverside, many Willow Warblers were heard and a nest containing eggs was found. The Wood Warbler, Garden Warbler and Redstart were singing in Helmside Ghyll. Cuckoos were frequently heard, and one was seen perched on a tree, attended by a Tree-pipit which appeared to be trying to drive it off. Tawny Owls were calling at night, and one was seen during the daytime. The Common Sandpiper was frequently met with along the riverside, and a nest was found in a bank by the roadside, the bird flying off just as Mr. Mason's car was passing. Many Curlews were seen on the hills, and two young were found on different areas of Rise Hill. Lapwings were seen, but not very many, and one or two pairs of Redshanks, a few Snipe were put up and a nest was found. A few pairs of Golden Plover occurred on Rise Hill. Corncrakes were calling in most of the fields in the valley, and Mr. Malins Smith had a good view of one. A Waterhen's nest was found in a marshy field by the river. A Kestrel's nest, containing young, was found on a ledge of rock. A brood of Grouse were found on Helms Knott. One or two Wood Pigeons' nests were seen, and a young one was noticed perched on a tree in Helmside Ghyll. Partridges and pheasants were also seen.

Several additions could probably be made to this list, but the majority of the Vertebrate Section had to leave before the reports were given at the meeting.

DIPTERA (Chris. A. Cheetham) :—The following flies were mostly collected in the vicinity of the river or in Helmside Ghyll, some thirty odd of them have not been recorded previously from the North-west, V.C. 65. Perhaps the most interesting was a small Limnobid which was in plenty on the dry river bed where the stones were replaced by the solid limestone. It has only been caught once before in Yorkshire, near Coverham Abbey, and is known as *Rhabdomastrix schistacea* Mg. Another nearly related species was *Gonomyia tenella* Mg.

Another interesting species was *Dicranomyia pilipennis* Egg. Others of this genus were *didyma* Mg., *mitis* Mg., *occidua* Edw. Two other uncommon Limnobids are *Epiphragma ocellaris* L. and *Ula macroptera* Mcq. The others in this group being :—

*Dicranota subtilis*, Lw.
*Tricyphona littoralis*, Mg.
*Limnophila bicolor* Mg.
*L. nemoralis* Mg.
*L. ochracea* Mg.
*L. lineola* Mg.
*Dactylolabis frauenfeldi*, Egg.
*Molophilus murinus* Mg.
*M. bifilatus* Verr.
*M. appendiculatus* Staeg.
*Ephelia marmorata* Mg.

There was one species of *Ptychoptera*, the rather rare *paludosa* Mg. and a single *Pachyrrhina maculosa* Mg., but the *Tipulas* were in plenty :—

*Tipula montium* Egg.
*T. lateralis* Mg.
*T. rufina* Mg.
*T. unca* Wied.
*T. variipennis* Mg.
*T. cheethami* Edw.
*T. scripta* Mg.
*T. maxima* Poda.
*Tipula fulvipennis* Deg.
*T. oleracea* L.
*T. vernalis* Mg.
*T. flavolineata* Mg.
*T. luna* Westf.
*T. variicornis* Mg.
*T. alpium* Bergr.
*T. subnodicornis* Zett.

Whilst in many of the dark spots on streamside and in the woods the phantom-like *Dolichopeza silvicola* Curt. was seen.

An interesting Mycetophild was the cave-dwelling *Speolepta* (*Polylepta*) *leptogaster* Winn. Others in this group were :—

*Boletina trivittata* Mg.
*Anaclinia nemoralis* Mg.
*Macrocera fasciata* Mg.
*M. stigma* Curt.
*M. angulata* Mg.
*Platyura nemoralis* Mg.
*Apoliphthisa subincana* Curt.
*Tetragoneura sylvatica* Curt.
*Mycetophila vittipes* Zett.

The few Empids caught were :—

*Trichopeza longicornis* Mg.
*Rhamphomyia nigripes* F.
*R. sulcata* Fln.
*Rhamphomyia flava* Fln.
*Hilara maura* F.
*Empis vernalis* Mg.

The most striking of the Syrphids was *Sericomyia lappona* L., others being :—

*Chilosia maculata* Fln.
*Chrysogaster Macquarti* Lw.
*Rhingia campestris* Mg.
*Sphegina clunipes* Fln.

The curiously marked *Dictya* (*Tetanocera*) *umbrarum* L. occurred in a place which in its mosses and appearance was almost a replica of the places it occurs in at Austwick.

A Dent Problem (Chris. A. Cheetham) :—Upper Dentdale certainly did not give the botanists anything like the easy ecological facts suggested by the simple geological structure, the valley bottom is cut in the Great Scar limestone and this was seen vividly in Hell's Cauldron and Black Dub, but we were not on limestone country according to the plants. The moss men missed such typical limestone ghyll plants as *Orthothecium intricatum* and *Plagiobryum Zierii* and they decided this was due to a lack of moisture on the limestone walls of the ghyll. The botanists missed the more typical plants of limestone areas in the fields bordering the stream and some explanation seems called for to account for these anomalies. The fact is that we were really not in a true limestone area such as we are used to in West Yorkshire. Here in Dentdale the limestone was buried, and it was also very solid in structure. Usually in our area we find the Great Scar limestone top above 1000 ft. O.D., full of fissures and crevices, allowing all water to pass through it and to issue below on the hill slopes under the limestone platform ; this gives a warm dry area on the limestone top for plants and plenty of moisture ready to issue from the limestone walls, where a gorge has been worn by a stream ; but in Dentdale this limestone summit has dipped steeply down until it is only 500 ft. O.D. and in the valley bottom. The stream bed shows very solid rock over which the water runs freely ; none enters this solid structure and so our stream walls are dry. The fields in the same way are far less drained and the little lime present in the water has come from the thinner limestone bands of the Yoredale sides of the valley, but not from the limestone below our feet. Lime may be present in solution in the water, but the valley soil owes nothing to the buried mass of Great Scar limestone.

All this is due to the abnormal dip of the rocks ; standing on the top of Whernside and looking south we see the limestone scars of Chapel le Dale their upper surface some 1200 ft. O.D., then turning north to Dentdale we find this surface in the valley bottom at 500 ft. O.D., a great alteration in a short distance, say five miles, and contrary to the normal dip to the South-east in other parts of the county. We may see this dip and the type of solid rock to advantage in the stream bed beyond Cowghyll and by the side of the road to Newby Head, here the absence of cracks and fissures is very noticeable, the water running along the surface of the dipping limestone bed.

*1933 August 1*

Bryology (F. E. Milsom) :—The dry conditions were disadvantageous for bryology in the open ground, and most work was done in the ghylls. In all, 92 species of mosses and 37 species of hepatics were noted, indicative of the richness of the district, which will repay further study. Unsuccessful search was made for *Habrodon Notarisii* on the various ash trees along the river bank.

Hacker Ghyll Wood, Scotcher Ghyll, and Helmside Ghyll were studied intensively, and Coombe Scar was also visited. In Hacker Ghyll Wood the best find was *Fissidens rufulus*, and in Scotcher Ghyll *Seligeria acutifolia* var. *longiseta*, *Heterocladium heteropterum* var. *fallax*, and *Nowellia curvifolia*. In Helmside Ghyll it was gratifying to see *Eurynchium Teesdalei* in splendid condition with fruit, while at Coombe Scar *Bartramia Halleriana* and *Hypnum sarmentosum* were gathered.

During the week-end a vist was paid to Frostrow Fell, Sedbergh, where the hepatii *Anastrepta orcadensis* was found to be in flourishing condition in its only recorded station in V.C. 65.

The following is a list of the most noteworthy species gathered :—

Mosses.

*Polytrichum strictum* Banks.
*Seligeria acutifolia* Lindb.
var. *longiseta* Lindb.
*S. recurvata* B. & S.
*Fissidens rufulus* B. & S.
*Tortula intermedia* Berk.
*Weisia rupestris* C.M.
*W. curvirostris* C.M.
*Bartramia Halleriana* Hedw.
*Mnium serratum* Schrad.
[1]*Heterocladium heteropterum* B. & S.
var. *fallax* Milde.
*Eurynchium crassinervium* B. & S.
*E. Teesdalei* Schp.
*Plagrothecium depressum* Dixon.
*Hypuum sarmentosum* Wahl.

Hepatics.

*Preissia quadrata* (Scop.) Nees.
*Metzgeria pubescens* (Schrank.) Raddi.
*Aplozia cordifolia* (Hook) Dum.
*Lophozia incisa* (Schrad.) Dum.
[1]*Nowellia curvifolia* (Dicks.) Mitt.
*Calypogeia arguta* Ness et Mont.
*Blephorostoma trichophyllum* (L.) Dum.
*Cololejeunea Rossettiana* (Massat) Schiffn.
*Lejeunea patens* Lindb.
*Microlejeunea ulicina* (Tayl.) Evans.

Fungi (F. A. Mason) :—One of the most noticeable features in the hedgerows of the district was the wide-spread occurrence of the diseased fruits of the Bird-Cherry, due to *Taphrina Pruni* (Fuckel) Tul., which causes a deformation known as ' pocket-plums ' or ' bladder-plums.' A number of other fungous galls, all caused by Uredines, were the following : *Puccinia Caricis*, distorting the leaves and more commonly the petioles of Nettle ; *P. Pringsheimiana*, on Gooseberry ; the æcidial form of *Gymnosporangium clavariaeforme* on both the leaves and fruits of the Hawthorn ; *Phragmidium subcorticium* on Wild Rose ; and *Triphragmium Ulmareae*.

[1] New to V.C. 65.

Other Uredines collected were :—

*Uromyces flectens* on Clover.
*U. Alchemillae* ; *U. Ficariae* ;
*U. Scillarum* ; *U. Junci* ;
*U. Dactylidis* on *Ranunculus repens* ;
*Puccinia expansa* on *Senecio Jacobaea* ;
*P. obtegens* on *Cirsium arvense* ;
*P. Hypochoeridis* ;
*P. major* on *Crepis paludosa* ;
*P. Chondrillae* on *Lactuca muralis* ;
*P. Betonicae* ;
*P. Conopodii-Bistortae* on Bistort, new to V.C. 65 ;
*P. Winteriana* on *Allium ursinum* ;
*Coleosporium Tussilaginis*.

A pile of damp sticks damming a drain to the Dee, afforded Mr. W. G. Bramley and the writer good hunting ; it yielded the following species : *Collybia tuberosa, Mycena tenerrima, Fomes ferruginosus, Poria mollusca, Stereum sanguinolenta, Polystictus velutinus, Irpex obliquus, Peniophora velutina*. Also a few Pyrenomycetes, *Nectria cinnabarina, Leptosphaeria ovina, Melanomma pulvis-pyrius, Diatrype disciformis, Diatrypella quercina, D. favacea*, and the following Discomycetes : *Calycella citrina, Coryne sarcoides, Orbilia leucostigma, Hyalinia inflatula*, new to V.C. 65, *Helotium herbarum* and *H. lutescens*. On a bank near the same place was found a large specimen of the Morel, *Morchella crassipes* Krombh., a species not previously recorded in V.C. 65. Only two other species among the larger Discos were noted : Miss L. M. Anderson collected *Acetabula vulgaris*, while Mr. W. E. L. Wattam brought in *Peziza vesiculosa*.

On wet sticks in Helmside Ghyll Miss D. Wooff collected two species of *Ombrophila, O. clavus* (A. & S.) Cooke and *O. rudis* (Berk.) Phill. respectively, and *Apostemidium Guernisaci* (Cr.) Boud. ; the two last-named species are new records for V.C. 65.

Miss Wooff also collected in the same Ghyll two insects attacked by fungi. The specimens were submitted to Mr. T. Petch, who has identified the fungus on both insects as *Entomophthora dipterigena* Thaxter, in one case on a Tipulid, while the other insect appears to be a Tick. This is the first record of the entomophyte in V.C. 65.

Agarics were scarce and the less common species were *Crepidotus Ralfsii, Flammula alnicola* and *Hypholoma sublateritium*.

The woods were too dry for Myxomycetes and only a few species were observed. Mr. J. L. Illingworth collected *Physarum viride, Didymium squamulosum, Arcyria denudata* and a *Trichia* sp. parasitized by *Tilachlidium tomentosa*.

Conchology (Mrs. E. M. Morehouse) :—It was very disappointing that the yield of molluscan life was not greater in the Dent area. Two especially, of the molluscs usually found on loose limestone walls, being entirely absent. No doubt this is due to the geological formation of the district. The commoner species of slugs were much in evidence, eight were taken in all. *Arion ater v. plumbea* (Roebuck) and *Arion intermedius* (Normand)—[*minimus*] (Simroth) in the valley of the River Dee towards Dent Station being the most interesting. Among the twenty land molluscs *Balea perversa* (Linné), *Acanthinula aculeata* (Müller) and *Euconulus fulvus* (Müller) were the most uncommon. *Ancylus fluviatilis* (Müller) was found on stones in the becks and streams in three or four localities.

Entomology (J. M. Brown) :—The week-end weather was almost ideal for the entomologists, who, though few in number, but assisted by a number of botanists, were able to do a considerable amount of work.

Although insects, as a whole, were not remarkably plentiful, a number of interesting species were taken. The most plentiful and noticeable on the uplands were the Small Heath butterflies and the upland Skipjack beetles. Soldier beetles of various species abounded, and Weevils were very numerous. About the streams during the daytime Stoneflies were present in swarms, and in the lanes during the evenings Caddis-flies and May-flies were flying in enormous numbers.

Butterflies and Moths were not represented by very many species, but the following were listed by Mr. W. E. Wattam :—

*Pieris brassicae* L.
*P. rapae* L.
*P. napi* L.
*Vanessa urticae* L.
*Pyrameis atalanta* L.
*Caenonympha pamphilus* L.
*Chrysophanus phloeas* L.
*Abraxas sylvata* Scop.
*Fidonia atomaria* L.
*Melanippe fluctuata* L.
*M. montanata* L.

and larvæ of the Oak Eggar moth (*Triphaena pronuba* L.).

The most interesting of the Coleoptera was *Rhagium mordax* D.G., taken by Mr. Cheetham, and the following were obtained while working in other groups :—

*Notiophilus biguttatus* F.
*Nebria gyllenhali* Sr.
*Agonum ruficornis* Gz
*Bembidion nitidulum* Mm.
*Brychius elevatus* Pz.
*Deronectes borealis* Gy.
*Stenus guttula* Ml.
*Athous haemorrhoidalis* F.
*Corymbites cupreus* F.
*C. incanus* Gy.
*Denticollis linearis* L.
*Podabrus alpinus* Pk.
*Cantharis pellucida* F.
*C. palludosa* Fn.
*Rhagonycha limbata* Th.
*Rhagium mordax* D.G.
*Gastroidea polygoni* L.
*Blaps mucronata* Lt.

Adult Hemiptera were rather scarce, but immature specimens were quite plentiful. Several good species were obtained. Oaks supplied *Calocoris ochromelas* and *Cyllocoris flavonotatus* in large numbers almost wherever this tree occurred, and several specimens of *Harpocera thoracica* were taken. The minute *Microphysa pselaphiformis* occurred, and in the River Dee the small and interesting *Micronecta minutissima* abounded, a species which does not appear to have been recorded for the county since 1868. The following species were taken :—

Heteroptera :

*Velia currens* F.
*Gerris lateralis* v. *costae* H.S.
*Microphysa pselaphiformis* Curt.
*Pithanus maerkeli* H.S.
*Stenodema holsatum* F.
*Calocoris ochromelas* Gmel.
*Pycnopterna striata* L.
*Plesiocoris rugicollis* Fall.
*Cyllocoris histrionicus* L.
*C. flavonotatus* Boh.
*Harpocera thoracica* Fall.
*Psallus betuleti* Fall.
*P. variabilis* Fall.
*P. varians* H.S.
*Callicorixa praeusta* Fieb.
*Micronecta minutissima* L.

Homoptera :

*Oncopsis alni* Schr.
*O. rufusculus* Fieb.
*Euscelis brevipennis* Kbm.
*Thamnotettix prasinus* Fall.
*Cicadula sexnotata* Fall.
*Cixius pilosus* Ol.
*C. nervosus* L.
*Psylla alni* L.
*P. peregrina* Forst.

A number of Sawflies were collected and these have been named by

Mr. W. D. Hincks, who has kindly supplied the following list (reserving one or two apparently rarer species for confirmation) :—

*Tenthredella* (*Tenthredo*) *mesomelas* L.
*T. atra* L.
*Allantus arcuatus* Forst.
*Tenthredopsis litterata* Geof., var. *varia* Gmel.
*Rhogogaster viridis* L.
*Pachyprotasis rapae* L.
*Dolerus aericeps* Thoms.
*D. aeneus* Htg.
*Strombocerus delicatulus* Fall.

The NEUROPTERA taken included the Scorpion-flies *Panorpa communis* L. and *P. germanica* L. ; the Alder-fly *Sialis fuliginosa* Pict. ; the Brown Lace-wing flies *Hemerobius lutescens* Fabr. and *H. stigma* Steph. ; and the Dusty-wing Flies *Conwentzia psociformis* Curt. and *Coniopteryx tineiformis* Curt.

A few PSOCOPTERA were obtained, including :—

*Amphigerontia bifasciata* Latr.
*Loensia fasciata* Fabr.
*Graphopsocus cruciatus* Klbe.
*Stenopsocus immaculatus* Steph.
*Caecilius flavidus* Steph.
*Mesopsocus unipunctatus* Mull.
*Elipsocus westwoodi* McL.
*E. hyalinus* Steph.
*E. cyanops* Rost.

PLECOPTERA (Stone-flies) abounded and were represented by the following species :—

*Perla cephalotes* Curt.
*P. carlukiana* Klp.
*Chloroperla grammatica* Scop.
*Isopteryx tripunctata* Scop.
*I. torrentium* Pict.
*Taeniopteryx risi* Mort.
*Leuctra inermis* Kmpy.
*Leuctra nigra* Pict.
*L. hippopus* Kmpy.
*Protonemura meyeri* Pict.
*Amphinemura cinerea* Oliv.
*Nemura avicularis* Mort.
*Nemurella inconspicua* Pict.

EPHEMEROPTERA (May-flies) abounded in the evenings, the swarms consisting largely of *Rithrogena semicolorata*. The following were recognised as adults :—

*Paraleptophlebia submarginata* Steph.
*Baetis binoculatus* L.
*B. scambus* Eat.
*B. vernus* Curt.
*Baetis pumilus* Burm.
*Centroptilum luteolum* Mull.
*Rithrogena semicolorata* Curt.
*Ecdyonurus venosus* F.

TRICHOPTERA (Caddis-flies) were also numerous, and the following species were taken :—

*Ecclisopteryx guttulata* Pict., in swarms in the evenings.
*Lasiocephala basalis* Kol.
*Polycentropus flavomaculatus* Pict.
*Beraea pullata* Curt.
*Philopotamus montanus* Don.
*Wormaldia occipitalis* Pict.
*Rhyacophila dorsalis* Curt.
*Agapetus fuscipes* Curt.
*Limnophilus sparsus* Curt.

A single species of Dragon-fly was plentiful about the head of Helmside Ghyll, viz. : *Pyrrhosoma nymphula* Sulz.

(Quite a number of species recorded above appear to be new to V.C. 65).

COLEOPTERA AND HEMIPTERA (M. L. Thompson) :—*Bembidian redtenbacheri* K. Dons. was met with on the margin of a pond by the roadside, near Hawes, and *Allodactylus affinis* Payk. (*geranii* Payk.) on early flowers of *Geranium sylvaticum*. On the higher slope of Widdale Fell *Ocyusa incrassata* Muls. and *stenus aceris* Steph. (*Arosus* Er.) were found in moss ; whilst the Hemipterons *Corixa proensta* Fieb. and *C. carinata* Sahlb. were common in a small tarn in the same locality.

FRESHWATER BIOLOGY (J. M. Brown) :—The upper reaches of the River Dee appeared distinctly unfavourable for animal life, the bed of

the stream being in many parts solid rock, worn deeply into gulleys and pot-holes, and holding few loose stones which could afford a foothold for the inhabitants. Here and there deeper and more tranquil portions occurred with more suitable bed. Below Dent Bridge the river bed was of a different type, consisting in great part of areas of shingle and sediment, with more vegetation. The most prominent inhabitants were as usual, larvae of Stone-flies, May-flies and Caddis-flies, associated with *Ancylus* (Freshwater Limpet), especially plentiful near Cowside, and *Gammarus* (Freshwater Shrimp). The Stone-fly larvæ, besides the more usual types, included both *Perla cephalotes* and *P. carlukiana*. The May-fly larvæ included *Heptagenia*, *Siphlonurus*, *Ecdyonurus*, and *Baetis*. The most numerous Caddis larvæ were *Hydropsyche*, *Plectrocnemia*, and *Rhyacophila*. The minute bean-shaped cases of *Hydroptila* were plentiful. On the upper surfaces of the submerged flat stones, the long, sediment entangling galleries containing *Tinodes wacheri* were conspicuous and plentiful, as were the tubes inhabited by the small Chironomid larvæ. *Simulium* larvæ and pupæ occurred. Planarians were not noticed and the Caddis, *Agapetus*, usually so common in upland streams, were not numerous here, though plentiful in other streams. Below the bridge the minute Hemipteron, *Micronecta minutissima*, associated with the beetles, *Brychius elevatus* and *Deronectes borealis* occurred in numbers.

Perhaps the most striking feature of the stream was the enormous number of egg-masses of Caddis and May-flies, and it was most interesting to watch the delicate-winged May-flies descending below the water and affixing their eggs to the undersides of the stones.

Helmside Beck was of interest. The lower portion running through the gorge was a rapid torrent with stoney bed and having a fauna similar to that of the Dee, including the larger Stone-fly larvæ. In the upland region, the stream flowed across the open moor, with much slower current and considerably more sediment in its bed. Here occurred larvæ of the May-fly, *Potamanthus luteus*, which was not noted elsewhere. In the more tranquil pools in this part of the stream *Callicorixa praeusta* occurred, and on the surface *Velia currens* and *Gerris*. *Gammarus* was very plentiful. Flying about the stream were many Dragonflies (*Pyrrhosoma nymphula*), which probably came from a neighbouring pool. In the bed of the stream the thread-like ' worm,' *Gordius*, was particularly numerous. The early stages of this organism are passed parasitically in the larvæ of the Alder-fly and other aquatic types. Thence transferred into the bodies of carnivorous beetles they pass a second period of parasitism, finally becoming free and mature in the water, depositing eggs which hatch into a larval form, which enters the first host and commences its strange life history. Alder-flies, *Sialis fuliginosa*, were flying in considerable number about here.

In many of the upland streams, especially those about Coomb Scar, enormous growths of the Diatom, *Gomphonema geminatum*, occurred, whose branching tubes formed dense sponge-like tufts on the wet surfaces of the partially-submerged stones, and formed a conspicuous feature in the stream.

Ecology of Dentdale (A. Malins Smith) :—The ecological characteristics of the upper part of the dale between Dent and Cowghyll, seem to depend on the fact that the Yoredales have mainly contributed to its soils. Containing, as they do, shales and sandstones, as well as limestones, they form a soil so slightly acid that certain plants characteristic of limestone can flourish, yet not basic enough to support a typical limestone flora. This was seen in the meadows bordering the river. Two indicator plants may be taken as a test. *Poterium Sanguisorba*, the Salad Burnet, so abundant on limestone grassland, was practically absent, while on the other hand *Rumex acetosa*, the Sorrel Dock, which

flourishes in meadows on acid soils, was also present in only small amount. The soil of the meadows was slightly acid to the B.D.H. indicator and appeared to be very uniform. *Geranium sylvaticum* and *Poterium officinale* were common here, and a most striking feature was the great abundance of the root-parasites *Rhinanthus minor* and *Euphrasia officinalis*. The growth of the grass must be much checked by these plants, and it was noted that in many fields the crop appeared very small in spite of the favourable season. A farmer stated that the grass usually thickened very much later in the summer and it is possible that at the time of our visit these parasites, which were in full bloom, were taking their heaviest toll. In the remnants of woodland by streams and in hedges in this area, the prominent trees were Elm, Aspen, Ash, and Bird Cherry. In the limestone gorge near Hell's Cauldron were found Dog's Mercury with a little Herb Paris and an especially flourishing and almost pure association of Garlic. Water dripping from one vertical face of this gorge formed a tufa on which were found *Nostoc commune* and the diatoms *Gomphonema geminatum* and *Cymbella cymbiformis*, with characteristic mosses. Scattered plants of *Pinguicula vulgaris* flourished here.

In Helmside Ghyll, a very steep-sided cleft in the Coniston limestone, the flora again showed an interesting mixture of plants characteristic of limestone and of gritstone. On the north-facing slope grew certain plants characteristic of dry oakwood on acid soil, *e.g.* foxglove, wood sorrel and *Aira flexuosa* and a few oaks formed part of the tree canopy. But there were, on the other hand, many ash trees, and ash seedlings of various ages were frequent, while wood sanicle was common in the ground vegetation. Elm and Mountain Ash, with planted Larch and Sycamore, also occurred and Sycamore and Oak were renewing themselves by seedlings. On the upper part of this slope the soil was slightly acid. Lower, near the stream, Dog's Mercury, Woodruff and Goldilocks all indicated a more basic soil, and the mosses were those characteristic of limestone, *e.g. Hypnum commutatum*. Besides showing this interesting mixture of basic and acidic floras, the Ghyll showed a striking difference between the two slopes in the abundance of ground vegetation. The north-facing slope had about 50 per cent. of bare soil covered with larch needles, while the opposite slope was almost completely covered with an abundant and varied covering, including *Mercurialis perennis, Geranium Robertianum, Epilobium montanum, Sanicula europea, Geum urbanum, Hedera helix, Lonicera periclymenum, Chrysosplenium oppositifolium, Rubus fruticosus, Fragaria vesca, Potentilla fragariastrum, Lactuca muralis, Veronica Chamaedrys, Scrophularia nodosa, Primula acaulis, Cardamine flexuosa* with Hart's Tongue, Male, Lady and Buckler Ferns. This greater abundance of vegetation was partly due to the greater amount of light received on this slope, an important factor in this deep and steep-sided ghyll, and partly to the dip of the rocks which was such as to give this side a greater supply of moisture also. In the field above the wood was some interesting vertical zonation of higher and drier ridges growing Ling, Bilberry, *Nardus stricta, Potentilla erecta* and *Aira flexuosa*, while the lower and wetter furrows showed *Galum palustre, Carex glauca, C. ovalis, C. echinata, Ranunculus flammula, Blechnum spicant* and *Pedicularis sylvatica*.

Coombe Scar provided another instance of a plant covering, including both basic and acid-soil species. Above the slope of loose slate screes, where the Parsley Fern flourished, was an almost vertical rock face producing an interesting mixture of plants. Such limestone indicators as *Rubus saxatilis, Melica nutans* and *Thymus serpyllum* were growing here, closely intermixed with Ling and Bilberry. The water issuing from this slope was slightly basic, and no doubt the roots of the limestone lovers were more plentifully supplied with this water, but it was impossible to separate the two constituents of the flora, they were so

closely and irregularly mixed. In the bog below, where *Primula farinosa* flourished, the same phenomenon was again seen. Side by side with *Primula farinosa, Orchis Fuchsii, Habenaria bifolia* and *Parnassia palustris,* wherever the vegetation was raised above the neutral water, Ling occurred, and it was here that *Listera cordata* was found, which normally grows in acid soils, under Ling or among other moorland plants.

Flowering Plants (W. A. Sledge) :—The lateness of the Whitsun holiday, coupled with the forwardness of the vegetation, provided a better show of flowers in meadows and hedgerows than is usual at this meeting, whilst the Hawthorn, as elsewhere in the county, was everywhere laden with blossom. The most interesting discovery was made during Saturday's excursion up the course of the Dee, when *Festuca sylvatica* was found in small quantity in the upper part of the Ghyll, This was a welcome find in view of the few localities which stand on record for this rare grass from the West and North Ridings. Other plants such as Herb Paris, Lily of the Valley, and Hart's Tongue Fern, which might have been expected to occur in some plenty in this Ghyll, were conspicuously rare, but Toothwort was seen in more than one place and *Scirpus compressus* and *Polygonum viviparum* were found in meadows above the river. Two fruiting specimens of *Adoxa moschatellina* were also collected.

At Colm Scar *Sedum Telephium, Melica nutans* and *Asplenium viride* were seen on the rocks, and in a very interesting marsh below the Scars the following plants were noted :—

*Oxycoccus quadripetalus*
*Primula farinosa*
*Pinguicula vulgaris* (a form with with very large flowers)
*Listera cordata*
*Orchis elodes*
*O. elodes* var. *leucantha.*
*O. incarnata*
*Selaginella selaginoides.*

*Stellaria nemorum* was also seen in a hedgebank below Helmside Ghyll.

## GEOLOGICAL NOTES.

The Geological Magazine for July contains a paper on ' Metamorphic Rocks of the Eastern Andes near Cuenca, Ecuador,' by G. Sheppard and G. H. S. Bushnell.

At a recent meeting of the Geological Society of London, Professor W. B. R. King and W. H. Wilcockson read a paper on ' The Lower Palaeozoic Rocks of Austwick and Ribblesdale.'

Dr. F. A. Bather has received the Mary Clark Thompson Medal of the National Academy of Sciences of the United States of America, at the hands of His Excellency the American Ambassador.

*The Transactions of the Cardiff Naturalists' Society,* Volume LXIV, are largely occupied by an extraordinarily valuable monograph on From Giraldus Cambrensis to the Geological Map : ' The Evolution of a Science,' by Dr. F. J. North. This is of considerably more than local interest.

*The Memoirs and Proceedings of the Manchester Literary and Philosophical Society,* Vol. 76, recently to hand, contains two important papers, namely, ' Man's Place in Nature as shown by Fossils,' by Sir Arthur Smith Woodward, and ' The Relative Value of Fossil Plants in the Stratigraphy of the Coal Measures,' by Dr. R. Crookall. The first is illustrated by a remarkable diagram showing that if the milk dentition of modern man were modified by the complete extrusion of the canine, this would resemble the permanent dentition of Piltdown man more closely than does the permanent dentition of any ape, such as the chimpanzee. The second is illustrated by some plates of coal measure plants, which are remarkable for their excellence.

The late Bernard Hobson, of Sheffield, has bequeathed a thousand pounds to the Yorkshire Geological Society.

J. C. A. Roseveare writes on ' Land Drainage in England and Wales ' ; E. Morton on ' The Geology of the Goyt Valley ' ; and W. Rushton on ' Biological Problems in Relation to Water Storage,' in Volume XXXVII of the *Transactions of the Institution of Water Engineers*. The same useful work contains a Contents and Subject-Index to the thirty-seven volumes issued by the Institution, which will be of value to bibliographers.

According to Mr. J. P. T. Burchell's letter in *The Geological Magazine* for June, Professor Boswell and Mr. W. S. Bisat are said to confirm his records of flint implements in glacial beds.

Stanley A. Beaver's paper on ' The Iron Industry of Northamptonshire, Rutland and South Lincolnshire,' in *Geography* for June, covers a much larger area than might be assumed from the title.

Jane Longstaff continues her wonderful work among fossil Gasteropods in *The Quarterly Journal of the Geological Society of London*, No. 354, in ' A Revision of the British Carboniferous Loxonematidæ,' with Descriptions of New Forms. In the previous part, No. 353, of the same publication, Professor W. S. Boulton describes ' The Rocks between the Carboniferous and Trias in the Birmingham District.'

*The Proceedings of the Geologists' Association* recently issued contain details of Demonstrations at the British Museum (Natural History) on " Palæontological Technique and of Evolution " and " The Early History of Palæontology."

Dr. C. O. Stallybrass's Presidential Address to the *Liverpool Geological Society* on ' Early Man and his Geological Setting ' appears in the Society's *Proceedings*, edited by Dr. D. A. Allan, and printed by Messrs. A. Brown & Sons, of Hull.

Dr. F. J. North continues his studies of Early Geological Maps in a paper entitled ' From Giraldus Cambrensis to the Geological Map,' printed by the Cardiff Naturalists' Society.

A portrait of the late P. M. C. Kermode, who did so much for Manx archæology, geology and natural history, appears in *The Twenty-eighth Annual Report of the Manx Museum*.

G. E. Collins writes on " From Fen to Farm, from Heath to Husbandry," in *The Lincolnshire Magazine*, No. 5.

I. P. Tolmachoff in *The Geological Magazine* for June writes : ' It would be desirable if I should designate genolectotypes for the four new genera of corals created by me. New genera *Peetzia and Cypellophyllum* (=*Craterophyllum* Tolmachoff) and monotypic, with *Peetzia minor* Tolm., and *Cypellophyllum abyssum* Tolm. (=*Craterophyllum abyssum* Tolm.) as respective genotypes. Genolectotype of the new genus *Stelechophyllum* (=*Stylophyllum* Tolm.) is *Stelechophyllum venukoffi* Tolm. (=*Stylophyllum venukoffi* Tolm.), and that of the genus *Disophyllum* is *Disophyllum symmetricum* Tolm.'

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## NEWS FROM THE MAGAZINES.

*The Entomologist* for July contains ' The larvæ of Oporinia christyi Prout and their variation (Lep. Geometridæ), by J. W. H. Harrison ; ' British Gall causing Cynipidæ, some notes on their emergencies,' by M. Niblett ; ' Two new South African species of Dixa (*Diptera*),' by H. G. Wood ; ' Notes on Braconidæ. XIV. Alysiides,' by C. Morley ; and numerous Notes and Observations.

*The Entomologist's Record* for June contains the following : ' Plusia moneta Fab. var. esmeralda Oberthur,' by P. S. Smith (with plate, a pale variety) ; ' Donegal in August,' by Canon Foster (Lepidoptera) ; ' Paris and Mouthier (Doubs.) in July-August, 1932,' by E. B. Ashby (Lepidoptera) ; ' The Mystery of Little Black ' (*Chrysoclista atra* Haworth—Lep., Cosmopterygidæ), by T. B. Fletcher and H. Stringer ; ' Zygænæ, Grypocera and Rhopalocera of the Cottian Alps compared with other races,' by R. Verity ; ' Notes on Collecting,' etc. ; and supplement ' British Noctuæ,' by H. J. Turner.

At the bottom of page 1098 of *Index Animalium* by C. Davies Sherborn, Part XXXIII, which is just issued, is one word—' Finis.' There is no flourish of trumpets, no editorial, and probably that one word has appeared with a sigh of relief to every naturalist, and more particularly to C. Davies Sherborn, who, by a great stroke of good luck, has been spared to finish this monumental work. The first volume of this remarkable index contained all the names of genera and species in the animal world up to 1800, and now scientists have a record of every name which has appeared in an enormous literature during the years 1801 to 1850. Dr. Sherborn has devoted the greater part of a very busy life to this particular publication, and we can safely say that its continuation from 1850 is an absolute impossibility unless a whole army of Sherborns can be employed to do the work.

*The Entomologist's Monthly Magazine* for July contains ' Remarks on the Coleoptera of the Red Sea coast region of the Sudan ' (*concluded*), by H. B. Johnston ; ' *Dyschirius luedersi* Wagn. in Britain,' by K. G. Blair (distinguished from *aeneus* Dej. and recorded from ten localities in the South of England, mainly found in salt marshes) ; ' Dendrosoter protuberans Nees (*Doryctinae, Braconidae*) ; ' A Species of *Hymenoptera Parasitica* new to Britain,' by H. Donisthorpe (from Windsor Forest) ; ' *Diprion Polytomum* Htg. A sawfly not previously recorded from Britain,' by R. B. Benson (two specimens from Hampshire) ; ' A new Addition to the British List of Corixidæ,' by W. E. China (*Sigara castanea* Thoms. distinguished from *S. moesta* Fieb. and recorded from ten localities in Britain) ; ' British Trichoptera, Ephemeroptera and Plecoptera in 1932,' by D. E. Kimmins ; ' *Eutachina baranoffi*, a new British Tachinid,' by C. J. Wainwright (taken in the New Forest and allied to *larvarum* L.) ; and ' Insect immigration on the Norfolk Coast,' by the editors. Dr. M. Cameron commences ' New Species of Staphylinidæ (Col.) from Japan.'

*The London Naturalist.* The Journal of the London Natural History Society, 1932. This publication is, as usual, full of interesting articles, of which it is impossible to give a full list. Among the most noteworthy are the following : ' Nature through the Ages,' being the presidential address of Miss C. E. Longfield ; ' The Great Crested Grebe in the London Area,' by P. A. D. Hollom, giving notes on 68 pairs in the district ; ' Brambles of Kent and Surrey,' by W. Watson ; ' Notes on the Dragonflies of Epping Forest,' by E. B. Pinniger ; ' The Fritillary (*Fritillaria meleagris* L.) ' by H. Spooner, with two charming plates. (This interesting flower is found in a locality in Berkshire.) ; ' Ornithological Records of the London Area,' by the Records Committee. (The total for the area is now 212 forms, 99 of them nesting.) ; ' British Butterflies in 1932,' by H. J. Burkill. (Though, on the whole, 1932 has been a poor year, still one or two species have been taken in plenty. *Colias croceus* Fourc. appeared along the Southern coast, a few specimens of *Apatura iris* L. have been taken in Sussex, while *Limenitis sibylla* L. continues to spread and is now well established in various places round London.) ; ' Birds in the London Area, 1932,' by the Records Committee (with arrival of migrants) ; ' Plant Gall Records for 1932,' by H. J. Burkill (numerous interesting records) ; and the continuation of ' Botanical Records of the London Area' (*Umbelliferae* to *Campanulaceae*).

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# OBSERVATIONS ON THE PECULIAR GROWTH HABIT AND THE ANATOMY OF DOG'S MERCURY (*MERCURIALIS PERENNIS* L.).

N. GILL.

## Introduction.

In the majority of English herbaceous dictoyledons the growing point of the aerial shoot gives rise, in succession, to the following structures :—

(1) Leaves with axillary vegetative buds.
(2) Leaves with axillary inflorescences.
(3) Bracts with axillary flowers.

In some species the final stage is the production of flowers without the subtending bracts. According to Warming[1] this is the result of a tendency in the vegetative axis, to the earlier production of the flower at the expense of the bract, so that, finally, the flower only may be produced. In many species the production of axillary inflorescences does not occur and the growing point reverts directly from formation of leaves with axillary vegetative buds to the production of bracts with axillary flowers. In each case, however, the aerial shoot tends to terminate in an inflorescence and the apical meristem either becomes transformed into a terminal flower of the inflorescence, or is represented at the apex of the inflorescence as a small mass of tissue no longer meristematic. Thus after production of a terminal inflorescence, all elongation growth of the primary axis is, of necessity, brought to a close, and if elongation growth is to continue it must be carried on by development of shoots from the lateral buds below the flowering region.

A few exceptions to the general growth habit outlined above occur in England, the most common being *Mercurialis perennis* L., which has therefore been examined in some detail during a study of the effect of flower production upon the anatomy of the plant axis.

## The Growth Habit of *Mercurialis perennis* L.

This is one of the earliest English flowering plants, appearing in full bloom about the end of February. *Mercurialis perennis* is peculiar in that it produces the following succession of structures upon its primary axis :—

(1) Leaves with axillary vegetative buds.
(2) Leaves with axillary inflorescences.
(3) More leaves, and not bracts with axillary flowers as in the system described on page 195 (fig. 1a). Very few



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English herbaceous species recommence vegetative growth at the apex after the formation of flowers, and the only other species of which the writer is aware are *Lysimachia thyrsiflora* L., *Lysimachia Numularia* L., and *Veronica Scutellata* L.

In *Mercurialis perennis* the renewed vegetative growth at the apex after flowering continues for a short time only, and from mid-summer to the death of the shoot, about November, no further leaves are normally formed at the apex, although the meristem is apparently still healthy.

The cessation of activity of the apical meristem in the production of leaves coincides with the time when the leaves of the trees overshadowing the plants have attained full size and the intensity of light is thus greatly reduced. It was thought that this might be the factor bringing about cessation of apical growth. Large numbers of plants growing in shady woods were compared with plants growing in more exposed positions and it was found that normally there was no marked difference in the numbers of new leaves formed at the apices of the plants after flowering, the number varying, in each case, between one and five pairs. In some exceptional cases, however, plants receiving almost full daylight had apparently renewed terminal growth after the normal cessation of growth, and as many as five pairs of additional leaves formed above the normal ' post-flowering ' leaves. These additional leaves were very noticeable, being of a light yellowish-green colour, in contrast with the dark green of the leaves below. The new growth stood out against the normal plants in the same way as the secondary elongation growth of oak and other trees referred to by Wight[2] and Dibb[3]. As a rule, only odd plants had developed as described, but in some well-exposed positions large numbers of such plants were observed. A careful search was made for similar plants in shaded positions, but without success.

About the time of cessation of leaf production in normal plants, lateral underground buds at the base of the shoot begin to grow out to produce underground stems of varying length (fig. 1b). At the apices of these the shoot of the following year begins to form. The young shoots reach an advanced stage of development before winter commences and the winter-rest begins after the leaves, together with the inflorescence initials in their axils, have developed. Thus, when renewed activity begins in spring the plant at first merely expands the leaves and floral organs formed during the previous summer, at the expense of food material stored in the underground stem, and after this expansion renewed growth of the apical meristem commences, giving rise to additional leaves without

axillary inflorescences. The flower initials are thus produced when the available soluble carbohydrate will be high, but

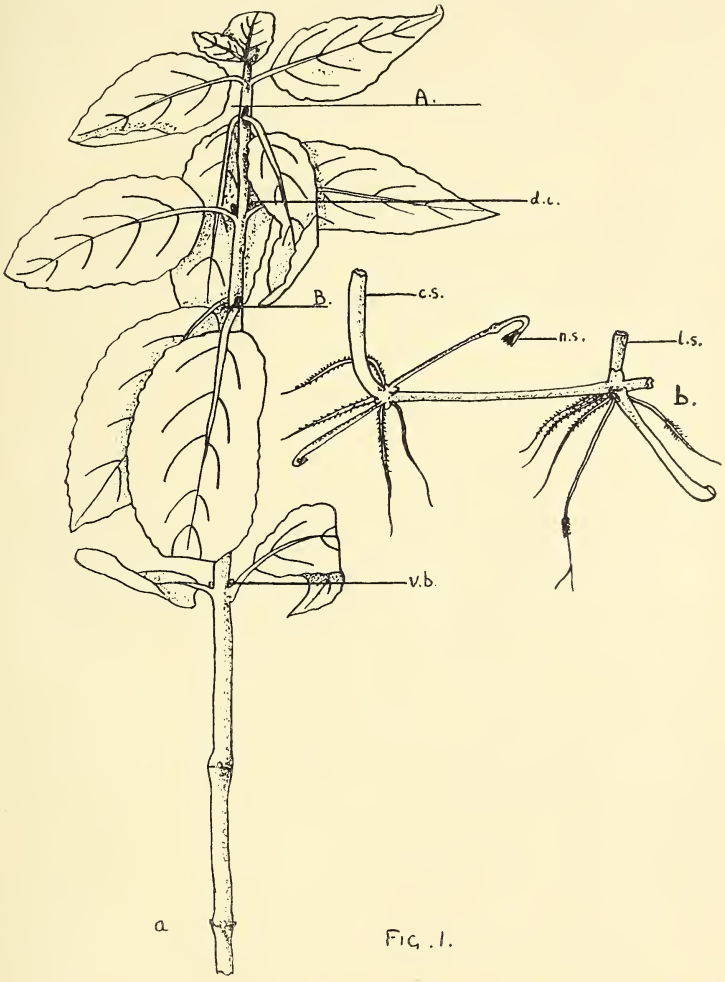


Fig. Ia.—**Shoots of *Mercurialis* showing new vegetative growth after flowering.**
v.b.—**vegetative bud.** d.i.—**remains of dead inflorescence.**
Fig. Ib.—**Underground portion of same plant.**
c.s.—**base of shoot of current season.**
l.s.—**stump of shoot of last season.**
n.s.—**next season's shoot.**

when renewed growth of the apical meristem commences, after the expansion of the leaves and flowers already formed, the soluble carbohydrate will be low and conditions are thus favourable to further vegetative growth. Thus, the peculiar

growth habit may arise as a result of the discontinuity of growth of the apical meristem.

The number of additional leaves formed after flowering seems to be about the same in both male and female plants, varying from one to five pairs. The leaves of the male plant are, however, larger, and a considerable difference in the length of stem bearing the additional leaves was observed, as shown in Tables 1-4.

TABLE 1.

Measurement, in cms., of the length of the basal vegetative, middle inflorescence, and terminal vegetative regions of female plants of *Mercurialis perennis*. In shaded position.

| *Basal region below B (fig. 1).* | *Flowering region between A and B.* | *Terminal region above A.* | *Total.* |
|---|---|---|---|
| 18·0 | 6·5 | 1·5 | 26·0 |
| 19·7 | 3·5 | 3·2 | 26·4 |
| 18·1 | 5·4 | 1·1 | 24·6 |
| 18·2 | 6·6 | 4·3 | 29·1 |
| 18·6 | 7·0 | 1·5 | 27·1 |
| 17·8 | 9·0 | 3·0 | 29·8 |
| 18·1 | 5·4 | 4·7 | 28·2 |
| 17·4 | 7·0 | 1·5 | 25·9 |
| 15·4 | 7·8 | 3·4 | 26·6 |
| 18·2 | 6·7 | 5·6 | 30·5 |
| 15·9 | 8·2 | 3·8 | 27·9 |
| 17·9 | 4·6 | 3·2 | 25·7 |
| 19·7 | 4·3 | 2·4 | 26·4 |
| 18·8 | 6·9 | 4·3 | 30·0 |
| Mean ... 17·99 | 6·35 | 3·11 | 27·45 |

TABLE 2.

Measurement, in cms., of the length of the basal vegetative, middle inflorescence, and terminal vegetative regions of male plants of *Mercurialis perennis*. Growing close to plants in Table 1.

| *Basal region.* | *Flowering region.* | *Terminal region.* | *Total.* |
|---|---|---|---|
| 21·5 | 4·6 | 11·1 | 37·2 |
| 17·7 | 6·6 | 12·2 | 36·5 |
| 22·9 | 3·4 | 8·1 | 34·4 |
| 24·8 | 6·8 | 7·8 | 39·4 |
| 15·9 | 5·8 | 14·7 | 36·4 |
| 18·6 | 9·1 | 12·9 | 40·6 |
| 24·7 | 4·2 | 9·4 | 38·3 |
| 16·6 | 11·1 | 6·1 | 33·8 |
| 23·2 | 4·4 | 9·5 | 37·1 |
| 17·2 | 16·2 | 6·9 | 40·3 |
| 18·6 | 5·6 | 9·8 | 34·0 |
| 16·4 | 13·5 | 11·4 | 41·3 |
| 18·3 | 5·4 | 11·5 | 35·2 |
| 15·1 | 4·3 | 13·2 | 32·6 |
| Mean ... 19·39 | 7·21 | 10·33 | 36·93 |

TABLE 3.

Measurement, in cms., of the length of the basal vegetative, middle inflorescence, and terminal vegetative regions of female plants of *Mercurialis perennis*. Plants growing in less shaded position than those recorded in Table 1.

| *Basal region.* | *Flowering region.* | *Terminal region.* | *Total.* |
|---|---|---|---|
| 14·9 | 13·7 | 1·2 | 29·8 |
| 17·9 | 11·7 | 1·0 | 30·6 |
| 17·3 | 8·1 | 1·0 | 26·4 |
| 13·2 | 11·8 | 9·8 | 34·8 |
| 17·5 | 5·8 | 5·5 | 28·8 |
| 10·4 | 11·7 | 2·6 | 24·7 |
| 14·9 | 12·7 | 1·5 | 29·1 |
| 18·1 | 7·8 | 3·7 | 29·6 |
| 27·9 | 2·0 | 1·7 | 31·6 |
| 13·4 | 6·1 | 1·8 | 21·3 |
| 20·8 | 6·4 | 1·9 | 29·1 |
| 18·5 | 8·4 | 6·5 | 33·4 |
| 15·7 | 9·6 | 1·9 | 27·2 |
| 13·5 | 14·8 | 5·9 | 34·2 |
| Mean ... 16·71 | 9·33 | 3·29 | 29·33 |

TABLE 4.

Male *Mercurialis perennis*. In less shaded position than plants recorded in Table 2, and close to plants in Table 3.

| *Basal region.* | *Flowering region.* | *Terminal region.* | *Total.* |
|---|---|---|---|
| 12·2 | 18·8 | 15·4 | 46·4 |
| 18·2 | 5·8 | 15·8 | 39·8 |
| 15·2 | 6·2 | 18·8 | 40·2 |
| 24·7 | 7·4 | 11·0 | 43·1 |
| 20·1 | 11·3 | 10·9 | 42·3 |
| 20·8 | 6·1 | 16·6 | 43·5 |
| 12·9 | 10·4 | 14·7 | 38·0 |
| 15·7 | 16·3 | 10·7 | 42·7 |
| 10·0 | 14·9 | 15·5 | 40·4 |
| 15·8 | 5·2 | 20·8 | 41·8 |
| 21·0 | 6·0 | 7·6 | 34·6 |
| 15·3 | 10·0 | 8·8 | 34·1 |
| 15·8 | 5·9 | 14·4 | 36·1 |
| 19·1 | 7·3 | 13·1 | 39·5 |
| Mean ... 16·91 | 9·40 | 13·86 | 40·17 |

It will be observed that in each set of figures the total height of the male plant is definitely greater than that of the female, and that the difference is mainly due to the greater elongation growth of the shoot produced above the flowering region, the basal and inflorescence regions varying inconsiderably. This suggests that the development of the fruit reduces the elongation growth of the shoot developing above. This reduction is probably due to competition for food supply between the developing fruits and the growing point.

In this species the buds in the axils of the leaves of the aerial shoot do not normally produce lateral shoots, and all vegetative growth occurs in connection with the apical meristem. It is interesting to note, however, that a number of plants were observed in September which had been decapitated earlier in the year and had produced vigorous vegetative shoots from the axils of the first pair of leaves below the inflorescence region. This is interesting, because in species in which the terminal meristem ceases to exist as a result of flowering, growth continues by development of lateral shoots; in this case, however, the same result follows the extermination of the apical meristem by some external agency.

Another interesting observation was made on December 28th, 1932. The winter up to this date had been particularly mild and many *Mercurialis* plants in sheltered positions still had a living aerial shoot. Two such plants were discovered on which the last two pairs of leaves at the apex had axillary inflorescences. These plants had gone through the normal cycle of development, ending with the production of leaves without axillary inflorescences at the apex of the stem, and had then become active again and produced more leaves with inflorescences. This may be accounted for by the mild weather. The meristem, not being killed, resumed growth under conditions of high soluble carbohydrate favourable to flowering.

## Some Notes on the Anatomy of *Mercurialis*.

As the shoot elongates in spring protoxylem (cut off from the cambium) and phloem differentiate rapidly, and at this time large numbers of sieve tubes still containing nuclei are to be found in all parts of the stem and in the leaf petioles and inflorescence stalks. After the elongation of an internode has ceased, metaxylem is formed, but protoxylem still differentiates in the elongating internodes above as was recorded by Thoday for sunflower.[4] After the rapid elongation of the shoot, phloem differentiation becomes slow, but some sieve tubes containing nuclei were always to be found near the cambium. Further differentiation of phloem occurred in the stem after fruiting, probably in connection with the downward transfer of food from the leaves to the storage tissues of the underground stem. In the inflorescence axis of the female plant a small amount of xylem and phloem are added as the fruits develop.

In an elongating internode of the shoot the vascular tissue is arranged in eight bundles. After elongation has ceased the bundles become joined by the development of an interfascicular cambium from which are produced two to eight

rows of long lignified parenchyma cells. At the time the interfascicular parenchyma cells begin to lignify a Casparian strip, which is not dissolved by concentrated sulphuric acid, forms on the radial walls of a ring of cells of the cortex next to the vascular bundles. This primary endodermis first becomes evident opposite the vascular bundles, but as the interfascicular parenchyma lignifies, it gradually spreads to a complete ring of cells around the stem. The primary endodermis and the lignified interfascicular parenchyma do not form in the higher internodes, nor at any of the nodes, and just above and below the oldernodes the Casparian strip is only seen in cells opposite the vascular bundles.

Secondary elongation of the axis after normal cessation of growth causes renewed vascular differentiation throughout the stem.

New xylem and phloem are differentiated in the old rhizome in late summer in connection with the formation of the new rhizome bearing next season's shoot.

References.

[1] Warming, E. *Forgrenings forhold nos Fanerogamarne*, 1-172 ; Copenhagen, 1872.

[2] Wight, W. 'Secondary Elongation Growth in Oaks, 1929,' *The Naturalist*, 65-70, 1930.

[3] 'Yorks. Nat. Union Ann. Rep., 1927, Bot. Sect.' *The Naturalist*, p. 153, 1928.

[4] Thoday, D. 'On the organisation of growth and differentiation in the stem of the Sunflower,' *Ann. Bot.*, 36, 489-510, 1922.

## AN ADDITIONAL RECORD OF CAPRIA NIGRA PIET (PLECOPTERA).

G. A. NELSON : W. D. HINCKS (No. 33).

On April 1st we were fortunate in taking specimens of this interesting Stone-fly on the River Wharfe at Harewood Bridge. Two of the three males taken (one subsequently lost) were found under stones and the third was running on a sandy spit.

Our efforts to find further specimens of these and of the females were totally unsuccessful. All were of the micropterous form with the wings reduced to merest rudiments. Morton (*E.M.M.*, 1929, p. 133) records the occurrence of similar specimens but says that this condition has previously escaped notice. Whitehead (*Nat.*, 1929, p. 405) has this species from V.C. 62 and 64 ; in the latter vice-county from River Laver, Galphey and Meanwood Beck, Leeds. The range of dates given is April 2nd to 16th.

Further Note on *Capria nigra*.—A single female of this species was found by us on a later excursion (April 18th). This was taken resting on an exposed stone in a stream at Scarcroft.

## FLIGHT IN INSECTS.

W.H.P.

Interest in the problems of flight has led Professor A. Magnan of the Collège de France, to study the problems of flight in insects (*Actualités scientifiques et Industrielles*, Nos. 46 and 60). The study is being carried out with ultra-rapid cinematograph cameras which can take as many as 12,000 views per second, a usual speed being 2-3,000 views per second. The principle of these cameras is that a number of films and lenses are used, the exposures of the films being synchronised so that the photographs are taken in known order.

A large number of insects have been photographed in flight with this instrument, attention being paid particularly to hovering flight, where it is possible to calculate the work required to hold the weight of the insect against gravity and the work done by moving the wings. In order to estimate the latter, the area of the wings, the amplitude of their beats and the number of beats per second are measured. The highest number of wing beats recorded per second is 160 for *Sarcophago carnaria* and *Musca domestica*, with wing beats respectively of 100° and 90° in amplitude. Most of the Diptera have over 100 beats per second, but *Tipula gigantea* has only 48, and the beats only extend over 70°. Among Hymenoptera, *Bombus muscorum* does 128 beats per second, *Vespa crabo* only 53. The Lepidoptera are still slower, ranging from 48 in *Plusia gamma* to 8 in *Philosamia cynthia*. *Vanessa cardui* is typical with 21 beats per second. Neuroptera are rather similar, 20 to 40 beats, and *Ephemera vulgata*, for example, has 29 beats per second. The Coleoptera range somewhat higher, 33 in *Lucanus cervus* to 72 in *Telephorus fuscus*.

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## SCUTELLARIA MINOR L. IN LUNEDALE.

CHRIS. A. CHEETHAM.

The Lesser Skullcap is an uncommon plant in Yorkshire and it has no station recorded in our Flora for the Lune drainage although it is noted in the West Lancashire Flora from the Arkholme and Whittington moors. On a recent visit to Keasden I found it in fair quantity and in nice flower. The date, July 17th, is a month earlier than we usually find the Marsh Gentian in flower at this place, but this year is an exceptionally early one for many species and the Marsh Gentian is one of these, for it was in nice flower. A moss, *Campylopus atrovirens* De Not., occurs in plenty on this moor ; in Yorkshire this species is usually found on older rocks of Silurian age but it is plentiful here where the rocks belong to the Millstone grit and shales of carboniferous age.

# THE PALÆOBOTANY OF ROBIN HOOD QUARRY, LEEDS.

JAMES WALTON, B.Sc.

Robin Hood Quarry is situated four miles to the south of

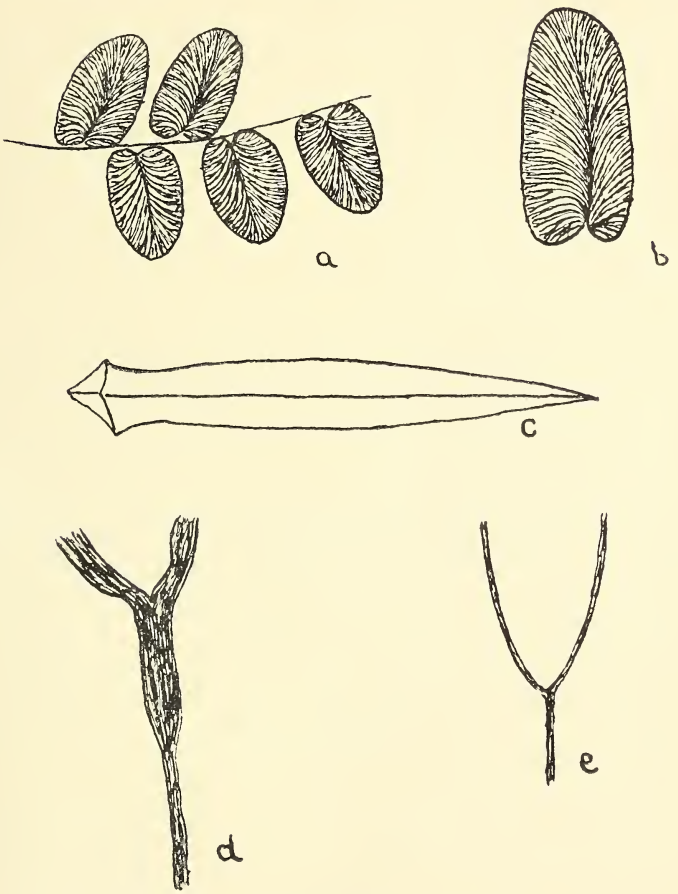


Fig. 1a—*Neuropteris heterophylla* **Brongt.**
b—*Neuropteris gigantea* **Sternb.**
c—*Lepidophyllum* **Sp.**
d and e—**Forking Stigmarian rootlets.**

Leeds and it provides an excellent section of the Middle Coal Measures at the horizon of the Haigh Moor Coal.

Details of the various beds have been given by Burnet and

Everett[1] and by Barnes[2] who have also described the tectonic features of the quarry. The following may be taken as a general section of the exposure :—

| | | Ft. | in. |
|---|---|---|---|
| 18. | Sandstone ... ... ... | 10 | 0 |
| 17. | Coal ... ... ... ... | 0 | 4 |
| 16. | Light Grey Shale ... ... | 6 | 0 |
| 15. | Coal ... ... ... ... | 0 | 4 |
| 14. | Light Grey Shale ... ... | 6 | 0 |
| 13. | Poor Coal ... ... ... | 2 | 0 |
| 12. | Dark Grey Shale ... ... | 3 | 0 |
| 11. | Hard Sandstone ... ... | 1 | 6 |
| 10. | Grey Shale ... ... ... | 10 | 0 |
| 9. | Black Brittle Shale ... | 2 | 0 |
| 8. | Coal ... ... ... ... | 0 | 6 |
| 7. | Grey Shale ... ... ... | 12 | 0 |
| 6. | Upper Haigh Moor Coal ... | 3 | 6 |
| 5. | Grey Shale ... ... ... | 2 | 0 |
| 4. | Coal ... ... ... ... | 0 | 6 |
| 3. | Grey Shale ... ... ... | 39 | 0 |
| 2. | Lower Haigh Moor Coal ... | 2 | 6 |
| 1. | Grey Shale ... ... ... | 6 | 0 |

General Features.

The lowest bed exposed in the quarry is the grey shale underlying the Lower Haigh Moor Coal and this is characterised by the abundance of *Mariopteris* sp. and *Neuropteris heterophylla*. Specimens of *Calamites suckowi* are also fairly common, but in all cases the plants are mainly found in the septarian nodules. The overlying shale yields a very similar flora in the lower part but it becomes much more prolific at higher levels where it contains *Neuropteris heterophylla* and *Neuropteris gigantea* in abundance. The shale immediately underlying the Upper Haigh Moor Coal is ramified with stigmarian rootlets.

Above the Upper Haigh Moor Coal is a thick bed of grey shale which is crowded with well-preserved plant remains, but *Neuropteris heterophylla* is not quite so dominant as in the lower beds. *Neuropteris gigantea* is the most important fossil, but specimens of *Lepidophyllum* sp. are also far from rare. A feature of particular interest at this horizon is the

[1] Burnet, A., and Everett, J. H., ' Notes on Sections in a Quarry at Robin Hood, near Leeds,' *Trans. Leeds Geol. Soc.*, Part XVII, pp. 31-35, 1914.

[2] Barnes, W., ' Note on some New Sections in the Quarry at Robin Hood,' *Trans. Leeds Geol. Soc.*, Part XX, pp. 13-16, 1929.

presence of forking stigmarian rootlets (Fig. 1, d and e). Burnet and Everett record *Neuropteris osmundae* from this bed, together with erect trunks of Lepidodendron. Dr. Crookall also remarks on the abundance of Lepidodendron in the roof of the Upper Haigh Moor Seam.[1]

This shale is separated by a thin coal seam from two feet of black brittle shale containing abundant remains of Lycopodiales. In the overlying shale bed the only remains are a few calamites, but above this shale is a thin bed of hard grey sandstone, the base of which is crowded with well-preserved calamites. This passes up into grey shale and above this is a 2 ft. seam of coal which is followed by 12 ft. of grey shale divided into two beds by a thin coal seam. These upper shale beds contain many nodules and are very fossiliferous. *Mariopteris muricata* is the dominant fossil, although *Lepidodendron ophiurus* is very plentiful. Erect tree trunks have also been observed by Burnet and Everett.

Palæobotanical Details.

*Neuropteris heterophylla* Brongt. (Fig. 1a) and *Neuropteris gigantea* Sternb. (Fig. 1b) are the most abundant of the Neuropterideæ. The pinnules of the former have a length of about 8 mms. and a width of 6 mms. They are sessile and rounded at the apex and the terminal pinnule, which is often seen, is larger than the others. The midrib is strong at the base, but it divides into many clearly marked, closely packed veinlets which, although fewer, are stronger than in *Neuropteris gigantea*. The latter is found only as isolated pinnules which have a rounded apex and fairly straight lateral margins. *Neuropteris tenuifolia* (Schloth) is fairly common, and it has pinnules 15 mms. long by 5 mms. wide, and the margins converge slightly towards the rounded apex. The pinnules are contracted at the base and the midrib can be seen almost the whole of the length. The lateral veinlets are fine and evenly spaced. *Neuropteris microphylla* Brongt., which is rarely found in the lower beds, has oval pinnules with a broad base and few veinlets. *Mariopteris muricata* (Schloth.) is the only member of the Sphenopterideæ noticed, although Burnet and Everett have obtained *Sphenopteris trifoliolata* (Artis.).

The Lycopodiales and Equisetales do not call for any further comment except to note that *Lepidodendron ophiurus* Brongt. and *Lepidostrobus* sp. are very plentiful in the nodules of the higher beds, whilst *Lepidophyllum* sp. (Fig. 1c) is common in the shales above the Upper Haigh Moor Coal.

[1] Crookall, R., ' The Relative Value of Fossil Plants in the Stratigraphy of the Coal Measures,' *Mem. and Proc. Manchester Lit.* and *Phil. Soc.*, Vol. 76, p. 93, 1932.

SUMMARY.

Burnet and Everett published the following list of plants, identified by Kidston, from the beds at Robin Hood Quarry :—

| | BED. | | | | |
|---|---|---|---|---|---|
| | 7 | 9 | 14 | 14 *or* 16 | 16 |
| *Calamites cisti* Brongt. ... ... ... | — | — | × | — | — |
| ,, *undulatus* Sternb. ... ... | × | — | — | — | — |
| *Sphenophyllum cuneifolium* Sternb. ... | — | — | — | × | × |
| ,, *forma saxifragæfolium* Sternb. ... | — | — | × | — | — |
| ,, sp. ... ... ... | — | — | — | — | × |
| *Sphenopteris trifoliolata* (Artis.) ... ... | — | — | — | — | × |
| ,, sp. ... ... ... | R | — | — | — | — |
| *Neuropteris heterophylla* Brongt. ... ... | × | — | R | R | — |
| ,, *osmundæ* (Artis.) ... ... | × | — | — | — | — |
| *Mariopteris muricata* (Schloth.) ... ... | — | — | × | × | × |
| *Alethopteris decurrens* (Artis.) ... ... | R | — | — | — | — |
| *Lepidodendron simile* Kidston ... ... | — | × | × | × | × |
| ,, *ophiurus* Brongt. ... ... | — | × | — | × | × |
| ,, *aculeatum* Sternb. ... ... | — | — | × | — | — |
| ,, *obovatum* Sternb. ... ... | — | — | — | × | — |
| ,, cf. *ophiurus* Brongt. ... | — | — | — | — | — |
| ,, sp. ... ... ... | × | × | — | — | — |
| *Lepidophloios laricinus* Sternb. ... ... | — | — | — | — | — |
| ,, cf. *laricinus* Sternb. ... | × | — | — | — | — |
| *Lepidostrobus* sp. ... ... ... | — | × | × | × | × |
| *Lepidophyllum lanceolatum* L. & H. ... | — | — | × | — | × |
| *Cyperites bicarinata* L. & H. ... ... | — | — | — | — | × |
| *Stigmaria ficoides* Sternb. ... ... ... | × | — | — | — | — |

With the exception of *Sphenophyllum forma saxifragaefolium*, *Sphenopteris trifoliolata* and *Neuropteris osmundae* I have collected all the above, together with many additional species, making the following complete list up to the present :—

| | BED. | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 3 | 7 | 9 | 11 | 14 | 16 |
| FILICALES AND PTERIDOSPERMAE. | | | | | | | |
| *Neuropteris heterophylla* Brongt. ... | × | × | × | — | — | R | × |
| ,, *gigantea* Sternb. ... | × | × | × | — | — | — | — |
| ,, *tenuifolia* (Schloth.) ... | × | × | × | — | — | — | — |
| ,, *microphylla* Brongt. ... | — | — | R | — | — | — | — |
| ,, *flexuosa* Sternb. ... | — | — | — | — | — | — | × |
| ,, *osmundae* (Artis.) ... | — | — | × | — | — | — | — |
| *Mariopteris muricata* (Schloth.) ... | — | — | — | — | — | × | × |
| ,, sp. ... ... ... | × | — | — | — | — | — | — |
| *Cyclopteris* sp. ... ... ... | × | × | — | — | — | — | — |
| *Alethopteris decurrens* (Artis.) ... | — | — | R | — | — | — | × |
| *Sphenopteris trifoliolata* (Artis.) ... | — | — | — | — | — | — | × |
| ,, sp. ... ... ... | — | — | R | — | — | — | — |
| SPHENOPHYLLALES. | | | | | | | |
| *Sphenophyllum cuneifolium* Sternb. | — | — | — | — | — | × | × |
| ,, *forma saxifragæfolium* Sternb. ... ... | — | — | — | — | — | × | — |
| ,, sp. ... ... ... | — | — | — | — | — | — | × |

R indicates that the species is rare.

| | BED. | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 3 | 7 | 9 | 11 | 14 | 16 |
| LYCOPODIALES. | | | | | | | |
| *Lepidodendron lycopodioides* Kidst. (? Sternb.) ... | — | × | — | — | — | — | — |
| ,, *ophiurus* Brongt. ... | — | — | — | × | — | — | × |
| ,, cp. *ophiurus* Brongt. | — | — | — | — | — | — | — |
| ,, *simile* Kidston ... | — | — | — | × | — | × | × |
| ,, *acutum* (Presl.) ... | — | — | — | × | — | — | — |
| ,, *aculeatum* Sternb. ... | — | — | — | × | — | × | — |
| ,, *obovatum* Sternb. ... | — | — | — | × | — | × | × |
| ,, sp. ... ... | — | — | × | × | — | — | — |
| *Lepidophloios laricinus* Sternb. ... | — | — | × | × | — | — | — |
| ,, cf. *laricinus* Sternb. ... | — | — | × | — | — | — | — |
| ,, sp. ... ... ... | — | — | — | — | × | — | — |
| *Lepidostrobus* sp. ... ... ... | — | — | — | × | — | — | × |
| *Lepidophyllum lanceolatum* L. & H. | — | — | × | — | — | × | × |
| ,, sp. ... ... ... | — | — | × | — | — | — | — |
| *Stigmaria ficoides* Sternb. ... ... | — | — | × | — | — | — | — |
| *Pinnularia capillacea* L. & H. ... | — | × | — | — | — | — | — |
| Forking stigmarian rootlets... ... | — | — | × | — | — | — | — |
| EQUISETALES. | | | | | | | |
| *Calamites suckowi* Brongt. ... ... | × | — | — | — | × | — | — |
| ,, *carinatus* Sternb.... ... | — | — | — | — | × | — | — |
| ,, *goepperti* Ett. ... ... | — | — | — | — | × | — | — |
| ,, *undulatus* Sternb. ... | — | — | × | — | × | — | — |
| ,, *schutzeiformis* K. & J. ... | — | — | — | — | × | — | × |
| ,, *cisti* Brongt. ... ... | — | — | — | × | — | × | × |

The specimens of bifurcating stigmarian rootlets have been presented to the Museum of the Geological Survey and representative specimens to the Geology Department of Leeds University.

Finally, I would like to express my thanks to Messrs. George Armitage and Sons for allowing me access to the Quarry, to Dr. R. G. S. Hudson for his assistance, and to Dr. R. Crookall who has kindly examined many of the plants in the above list.

## THE SPREAD OF BIRCH SINCE THE WAR.

HAROLD J. BURKILL, M.A., F.R.G.S.

MR. F. H. DAY, in his notes in *The Naturalist* for July (p. 155) states that young Birches have taken possession in late years of open spaces on a moor he is studying in Cumberland. This statement is full of interest to botanists, and it would become more so if reports could be collected from all over the country. My own experience since the war has been mainly confined to the London area with short holidays further afield in some years.

Round London, Birches (*Betula pubescens* and *B. verrucosa*) have appeared in large numbers on nearly every open space where they were not to be seen before. The felling of Pines, etc., in the war years gave the Birches a chance, previously

denied to them, of which they were not slow to take advantage. Large numbers of Pines were cut down round the Black Pond, Esher, along the North Downs in Surrey, on Stoke Common, Bucks., etc., and the Birch is now growing plentifully in most of these areas—in some of them it is dense, but it is also covering spaces where, though open to it, it did not grow twenty years ago. Then Esher Common was covered with grass and a few patches of *Calluna vulgaris*. Birches were fruiting year after year on the other side of the boundary, but not until about 1920 did their seedlings appear on the former open space which they have now covered entirely. The seeds had been blown there before but had not germinated.

Similarly acres on Wimbledon Common have been invaded the last few years by Birch which before was restricted to the ground below the Windmill and the extreme eastern border. Kingston Vale is another instance. Formerly almost entirely clothed with *Molinia* it is now a home for countless Birches. One could continue the list of examples but the above should suffice to illustrate the point. I have only noticed one large area that seems immune, though there are old trees producing seed on its margin, and this is Farthing Downs near Purley, which has not yet shown signs of this spread of the Birch.

In 1929 and 1930 I found young Birches spreading in places on the Shropshire Hills, but not to the same extent as in Surrey, Bucks., Herts., Essex and Kent.

In 1921, I was for a few days at Ravenscar, and in 1922 at Castleton, but I do not seem to have any notes showing that Birch was appearing then on areas denuded of conifers.

The only solution I can suggest is that there is some climatic condition that has been exceptionally favourable to the growth of Birch in the last twenty years which has enabled the species to colonise areas which they had not done before. Sometimes the Birch has appeared on areas where the grass had been burnt in the dry summer of 1921, but I have seen others where there were no fires, and there has been no disturbance of the soil. Man has on other areas cleared away the previously dominant species and the Birch has taken advantage of the opening, and aided by the favourable conditions has itself become dominant.

At Esher Pine seedlings are appearing among the young Birches, but it should be many years before they can once more have the place almost entirely to themselves.

It would, as I have said above, be interesting to have records from other districts to see how far the spread of the Birch is due to man's handiwork, or to some other factor which we cannot control, or even estimate, but at which we can only guess.

# ON THE SOARING FLIGHT OF THE CHOUGH.

STUART SMITH, B.SC. (LEEDS).

THE Chough [(*Pyrrhocorax pyrrhocorax*) (L.)] has for some time now been classed among the rare and disappearing birds of Britain. There is little doubt that formerly it bred on the cliffs of the Yorkshire seacoast, although never so common in the east of the country as in the west. Now it seems confined to the cliffs of Cornwall and Devon, with possibly a pair here and there in Wales. Lt.-Colonel B. H. Ryves estimates that the number of breeding pairs in Cornwall is as low as six or seven (*Bird Notes and News*, 1931), figures which compare tragically with those of the Kite (*Milvus milvus* L.). That the loss of such an attractive bird is a real one will be agreed by all who have seen the Chough abroad, where, in such places as the Savoy Alps, and along with the smaller, but equally attractive, Alpine Chough

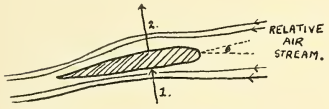


FIG. 1. NORMAL FLYING ANGLE.

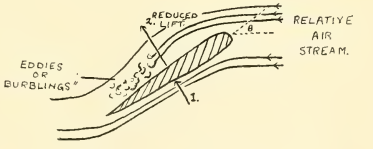


FIG. 2. STALLING ANGLE REACHED.

[(*P. graculus*) (L.)] it abounds. One of its most striking characteristics is the supreme ease and buoyancy of its flight, and particularly its ability to gain great heights from ground level with no flapping flight, but merely by soaring. At this it can scarcely have an equal among birds, and it is the object of the present paper to investigate the structure of the Chough's wing, with a view to attempting an explanation of this soaring ability in the light of modern aerodynamics.

It is first necessary to investigate the relative flow of air over and past a bird's wing, in flight, and for this purpose it is best to imagine the wing as stationary, and the air as flowing past it in relative motion. The action of a bird's wing in flight is a cutting or shearing one, so that the air is divided, and while some is piled up UNDERNEATH the wing, the rest is deflected ABOVE the wing, and by reason of the speed of the passage of the wing through the air, is unable to regain immediate equilibrium, and tends to form a vacuum ABOVE the wing. Both these effects contribute to the sum total of the uplift felt by a wing, but, contrary to what might be expected, the uplift derived from the vacuum above is nearly twice that derived from the piled up air underneath. (see Fig. 1). The resultant force acts at an angle of 90 deg. to the wing surface. As, however, the angle which the wing

presents to the air stream is increased, it is found that the resultant uplift decreases, until, about 15 deg., unstable equilibrium is reached, and a ' stall,' well known to airmen, commences. This is mainly due to the fact that, as the stalling angle is reached, the air is deflected downwards at an increasingly acute angle above the wing ; the flow of air along it is broken, and ' eddies ' commence, which tend to fill the vacuum and thus help to destroy the most important lifting factor of the wing (see Fig. 2).

In order to increase the angle at which ' stalling ' occurs, and thus arrive at a wing which was safe under low air speeds and high angles of incidence, a device had to be found to prevent this eddying, or ' burbling,' as it is called. This device, in the aeroplane wing, is known as the Handley-Page slotted wing, and consists of a small auxiliary wing fitted above the main ones, at the front, which—for reasons not

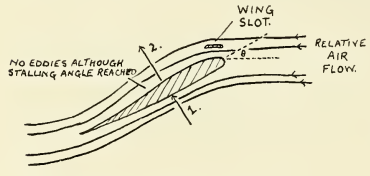


FIG. 3. STALLING ANGLE REACHED, BUT CONTROLLED BY SLOT.

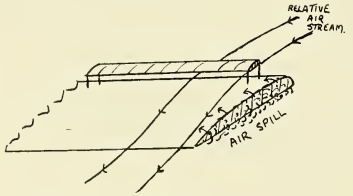


FIG 4. AIR SPILL.

within the scope of this paper—ensures a smooth flow of air over the wing from front to back, and by preventing eddies, enables what is known as a ' controlled stall ' to be accomplished (see Fig. 3).

There is a second factor also, which tends to reduce the lift of a wing, by filling up the vacuum above, and that is what is known as ' air-spill.' This is due to some of the air piled up UNDER the wing tending to slip round its end or tip, and rush up into the space above (see Fig. 4).

Having grasped these facts, we can now proceed to a consideration of how they are compensated for in a bird capable of a brilliant soaring display as is the Chough. All field observers will have noticed that in birds with wide rounded wings which indulge in aerial display—the buzzard, or the raven, and other corvidae for example—the primary feathers are widespread at the tips of the wings, giving a series of spaces, or slots, formed by the emargination of these primaries.

In the Chough, these slots are six in number (not counting that formed by the bastard wing), and their purpose is exactly similar to that of the Handley-Page slot already referred to in the aeroplane wing. The first primary in the Chough is

short, the second longer than the seventh, but the longest of all are the fourth and fifth. When the wing is spread, as in soaring flight, these seven primaries form a remarkable series of slots, giving a perfectly graded echelon formation, which, when seen with the wing on the eye-level, appear as a series of steps, the slot between the first and second primaries being nearer the bird's body and higher up than that between the second and third and so on. In this way, the air passing over a large area of the wing towards the tip, comes under the influence of a series of slots, which prevents eddies occurring and ensures maximum lift at high angles of incidence.

Now watch the Chough as it swings round in a magnificent sweep into the wind. The tail is depressed and fanned on one side to catch the air and turn the bird much as a rudder turns a ship, while the primary feathers automatically spray out like the fingers on the hand, and with no apparent effort the bird is lifted 50 ft. or more into the air ! The angle of incidence of the wing at this moment is very large—almost it appears at times to be nearly 30 deg. or 35 deg., as far as one can judge through glasses—an angle which is far past ' stalling ' on an uncontrolled wing. But the multiple slots control the stall, and the bird carries on with only a very slight movement of the control surfaces of the slotted wing, gaining altitude quite effortlessly, until in a few minutes it is soaring with others of its kind above the 5,000 foot peaks around.

But these slots also play an important part, too, in helping to prevent the second cause of loss of lift in a wing, namely, ' air-spill.' Obviously, the broader the tip of a wing, the greater the area over which the air can spill, and hence the greater the loss in lift due to this cause. If, however, the tip of the wing be broken up into a series of slots, as is the case with birds whose primaries separate in flight, the area over which air-spill can occur is greatly reduced, giving added efficiency in the way of lift.

Hence the wide-spread primaries at the wing tips of the Chough, with their resultant slots, are Nature's way of eliminating two defects well known in aeronautics, and account for the fine soaring powers of this and many other birds.

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The *Vasculum* for May contains especially two interesting articles on the ' Pearl Mussel in Hard and Soft Water,' by Professor A. E. Boycott and on ' Duckweeds,' by Dr. R. Blackburn. There are also shorter articles on ' A Reconstruction of Berwick Castle,' by J. E. Hull, and on ' Mimicry and Ventriloquy among Birds,' by R. Craigs.

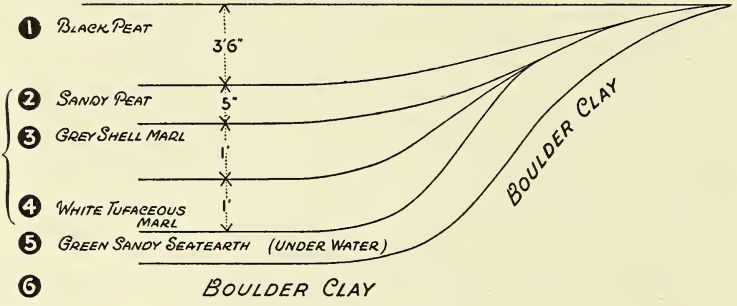
The *New Phytologist* for June contains articles on the ' Radial Growth of Xylem and the Starch Reserves of *Pinus sylvestris*,' by W. Wight, and ' The Role of Organic Acids in Plant Metabolism,' by T. A. Bennet-Clark. T. M. Harris describes a new member of the fossil Caytoniales and Lewis Knudson gives details of the non-symbiotic development of seedlings of *Calluna vulgaris* in pure culture.

# SOME NOTES ON THE HOLOCENE DEPOSITS AT NORTH FERRIBY.

C. W. AND E. V. WRIGHT.

AFTER the preliminary report on the Ferriby Peat deposits by Mr. Bisat in the *Trans. Hull Geol. Soc.*, for 1030, we made several examinations of the series at lowest spring tides and were fortunate in discovering a swamp deposit containing many fresh-water, mollusca.

Beyond the Ferriby Sewer outlet the base of the low cliff of peat is not exposed until the peat thins out several hundred yards to the east. Here we noticed a bed of sandy peat containing shells ; upon investigation the following section was noted, the swamp evidently occurring in an extensive hollow of the boulder clay.




The diagram is not to scale. The shells occur abundantly in the beds bracketed and fragments in the Green Seatearth.

Of the following photos, for which we are very much indebted to Mr. C. W. Mason, the top one shows the sandy peat (2), the grey marl (3), and the white tufaceous marl (4). Shells can be seen in the photograph. The bottom one shows an interesting rise in the tufaceous marl.

The following is a list of shells from the sandy peat, kindly determined by Mr. Musham.

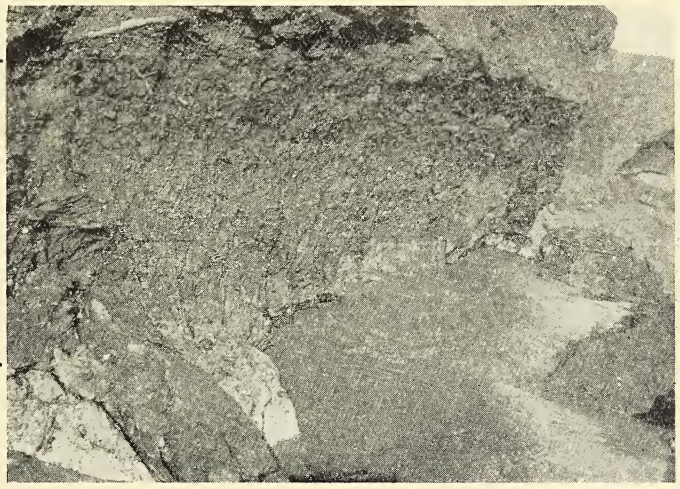
*Cepaea nemoralis*
*Arianta arbustorum*
*Hyalinia cellaria*
*Pyramidula rotundata*
*Carychium minimum*
*Pupa cylindracea*
*Clausilia laminata*
*Zua lubrica*
*Succinea elegans*
*Valvata cristata*
*Paludestrina stagnalis*
*Planorbis spirorbis*

Mr. A. S. Kennard has also very kindly identified a large number of snails from the grey marl collected by Mr. Bisat and ourselves and gives the following report on them.

REPORT ON THE NON MARINE MOLLUSCA (A. S. Kennard,

A.L.S., F.G.S.) :—From the small amount of material submitted twenty-six species were determined, viz :—

*Carychium minimum* (Müll.)
*Limnaea palustris* (Müll.)
*Limnaea truncatula* (Müll.)
*Planorbis leucostoma* Mill.




*Photos by*] [*C. W. Mason*

*Aplexa hypnorum* (Linn.)
*Lauria anglica* (Fér.)
*Vertigo pusilla* (Müll.)
*V. substriata* Jeff.
*V. angustior* Jeff.
*Columnella edentula* (Drap.)
*Acanthinula aculeata* (Müll.)
*A. lamellata* (Jeff.)
*Vallonia costata* (Müll.)
*Cochlicopa lubrica* (Müll.)

*Punctium pygmaeum* (Drap.)
*Goniodiscus rotundatus* (Müll.)
*Petasina fulva* (Müll.)
*Helicella cellaria* (Müll.)
*H. nitidula* (Drap.)
*H. pura* (Ald.)
*Helicella radiatula* (Ald.)
*Vitrea crystallina* (Müll.)
*Cepaea nemoralis* (Linn.)
*Clausilia rugosa* (Drap.)
*Marpessa Laminata* (Mont.)
*Succinea pfeifferi* Rossm.

Of these, six species are not known living from the East Riding according to the last census of the Conchological Society. They are, *Acanthinula aculeata, A. lamellata, Vertigo pusilla, V. substriata, V. angustior* and *Columnella edentula*. This is clearly a swamp faunule and would appear to indicate much damper conditions than now exist and probably much greater rainfall. It is now known that in early Holderness times there was a much heavier rainfall in the East and South-East of England than at present but these conditions had passed away in the Middle Bronze period. We may therefore conclude that the deposit cannot be later than the Beaker or Early Bronze age, *circa* 1800 B.C. This is an important discovery since no deposit of this class has been known from the East Riding ; the Holderness deposits such as Skipsea being of earlier age (Maglemose). Further investigation "may probably show a sequence."

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We hope to add extensively to the list when we have further and longer opportunities for collecting.

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## REVIEW AND BOOK NOTICE.

**The Country around Cirencester** (explanation of one-inch Sheet 235, England and Wales), by **Linsdall Richardson, F.R.S.E.,** with contributions by Professor J. A. Hanley, A.R.C.Sc., Ph.D., and H. G. Dines, A.R.S.M., pp. xi+119 ; 7 plates ; 5 text-figures. Price 3/- net. By post 3/4, from H.M. Stationery Office. This memoir is descriptive of the geology of the district bounded approximately by lines joining Cheltenham and Little Rissington ; Little Rissington and Lechlade ; Lechlade and Cirencester ; and Cirencester and Cheltenham, which is represented on a colour-printed geological map, new series, Sheet 235. The solid geology has for the most part been transferred from the Old Series geological map, but the superficial deposits have been surveyed specially for the purpose and their distribution indicated on the map. The author of the memoir is well known for his researches on the geology and geography of the Cotswolds. The introduction contains a description of the physiography of the district. Then follows a detailed account of the various geological formations. This account has been written in as simple language as the technical nature of the subject permits and is naturally of most interest to specialists on the various formations : it is an indispensable handbook to the subject for the district with which the memoir deals. A valuable part of the memoir is that on Agriculture, which is contributed by Professor J. A. Hanley, sometime Principal of the Royal Agriculture College, Cirencester. This contribution was written with the definite purpose of being of use to agriculturalists and to those concerned in the investigation of soils. It should prove valuable to botanists for it contains many references to the connection between the flora and parent rocks.

# FROM A MICROSCOPIST'S NOTE BOOK.

W. LAWRENCE SCHROEDER.

EARLY in March there was a remarkable 'florescence' of *Vorticellae* in two of my jars. By the end of the month—about March 26th—the *Vallisneria*, *Myriophyllum*, *Elodea*, and the filamentous algæ, *Spirogyra*, *Oedogonium*, and others, were covered: it seemed as if all the plants in the jars were coated with fluff. The state of things lasted until about the middle of April, when the weed was in the main clear.

On February 5th I made a vaseline life-slide on which was an encysted *Vorticella*. The denser inner part was surrounded with an almost transparent structure. There was very slight amoeboid movement. Two days later, the appearance had been modified, the movement was more marked, the inner denser part had put out a tongue-like process. On February 9th, the *Vorticella* was in full movement, and complete save for the 'stalk' but the beginning of that could be seen.

I had an interesting experience once, in showing slides of microscopic life on the lantern screen. I had prepared a slide on which was a female *Cyclops*, with well-developed eggs in the two sacs attached to the lower end of the body. Two and a half hours later, when the slide was thrown on the screen, all the eggs save three had hatched. The young *Cyclops* were swimming about in a very lively manner.

From a pond in the Shilden Valley I took, some years ago, on March 5th, a green *Hydra*, with eleven tentacles and a bud. Green *Hydra* have a way of disappearing into the debris at the bottom of the jar and then a few days later re-emerging in quantity.

On July 19th, 1916, I took from one of the Bramhope ponds a number of colonies of *Ophrydinum versatile*—a ciliate protozoon, similar in form to *Vorticella*. The largest specimen was nearly two inches in diameter, the smallest about half-an-inch.

Some duckweed—*Lemna minor*—got from one of the Bramhope ponds in early July, after being in the jar for just a month, presented an extraordinary appearance, the rootlets being covered with a species of *Closterium*. There were about fifty in one cluster, and over a hundred on the rest of the rootlets. There must have been several thousands in the entire group.

From a little pool on the top of Fairfield, near Coniston Old Man, I took, some years ago, in late August, the colonial *Dinobryon sertularia*, one of the Chrysomonadales.

There were eight in one colony, in another, at least twenty. Here and there were empty cases, in one of the

basal envelopes there were two cysts, in a penultimate case, there were one cyst and one individual. The individuals are attached to one side of the case-wall ; they can move in the case itself, and when disturbed they can retreat half down the case, their movement in the envelopes is gently Euglenoid. There are two cilia, unequal, the longer one does most of the searching about. The life-spot, highly refractive in one focus, is red, in other foci, green. It is amazing how such dendroid colonies can keep one direction in their locomotion ; for the direction must be given by a specific stress in the beat of the cilia.

## In Memoriam.

### HENRY LODGE.

Outside South Yorkshire, Mr. Lodge, of Normanton—whose unfortunate death took place on the 6th of June—was probably little known, but to his associates within that area he was recognised as a keen and accurate observer of nature.

He made no pretence at specialization, nevertheless his knowledge of botany, entomology and ornithology was by no means insignificant. He was a member of the South West Yorkshire Entomological and the Wakefield Naturalists' Societies. His collection of insects he left to his friend, Dr. McKie, of Normanton.

It was my own privilege to know Mr. Lodge very intimately, and perhaps he enjoyed few things better than to come along to my museum at Wakefield for an hour's shop talk. Since his retirement from railway service he had almost made a hobby of attending auction sales, and the last time I was in his company was at such a sale in Wakefield where we met accidentally.

In person he was quiet and dignified, of good carriage and address. He enjoyed a joke and was a good and entertaining conversationalist, his language being always well selected.

Mr. Lodge served on the railway for forty-one years, and only retired about eighteen months ago. He was 63 years old, and leaves a widow, one daughter and three sons. The funeral took place at Skelmanthorpe on the Friday following his death after but a short illness whilst under treatment at the Clayton Hospital, Wakefield.

Our sympathies go out to the bereaved family. All his friends will feel his loss keenly.—Charles Mosley.

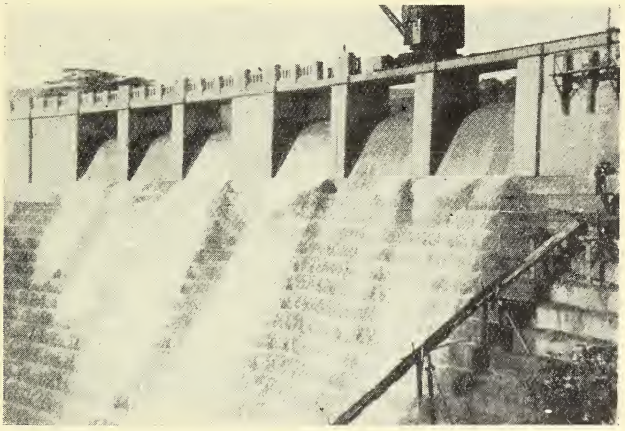
Messrs. Wheldon and Wesley have now issued Part II of Mr. F. W. Mills *Index of the Diatomaceae* (price, ten shillings). It deals with genera beginning with the letter A as far as the genus *Amphora*, in alphabetical order.

# YORKSHIRE NATURALISTS AT RIPPONDEN.

F. A. Mason, F.R.M.S.

A very encouraging feature of the visits of the Yorkshire Naturalists' Union to areas near the Lancashire border of the county is the good attendance as well as the enthusiasm of local members and associates. The excursion to Ripponden on Saturday, 8th July, provided no exception to past experiences and among the naturalists with an intimate knowledge of the geology, flora and fauna of the district who were present on that occasion, were Messrs. E. Hallowell, J. H. Lumb, C. J. Spencer, C. Fielding, Kaye, A. Bates, Thornton, and others

Under the guidance of Mr. Hallowell, a party, starting from the Triangle, Sowerby Bridge, worked up the river to Ripponden to the Old Bridge Inn at Ripponden where a halt was made for lunch. Thence to



the new Rishworth Dam, recently erected by the Wakefield Corporation Waterworks at their compensation reservoir. Here, the main party was joined by an afternoon party under the leadership of Mr. J. H. Priestley. The nature of the work involved in building the Dam, its structure and functions were explained by our member, Mr. A. G. Beaumont (Deputy Waterworks Engineer). Although the natural amenities of this beautiful part of Ryburn Dale have been interfered with by communal and industrial demands, after the replanting and restoration of roads now in progress, it seems likely that the valley will lose little by the change.

The rock garden of Mr. J. W. Barrett, at Rishworth, was visited and the rich collection of cacti and other interesting cultivated plants proved to be of considerable interest.

A meeting was held in the evening at the Derby Inn, Rishworth, at which the Chair was occupied by Mr. W. P. Winter, B.Sc. Reports were received from Messrs. A. G. Beaumont (Geology), A. Bates and Thornton (Botany), F. E. Milsom (Bryology); Mr. Thornton (Vertebrate Zoology), F. A. Mason, and the Chairman.

Mr. J. H. Priestley exhibited a collection of flint implements found in the district and made some interesting observations on their occurrence. He said that the thousands of microlithic flint implements found by himself and others on the hill tops point to their occupation at a date estimated at some ten to twelve thousand years. Similar tiny flint tools have been found in great numbers at Fere-en-Tardenois in France, and at Maz d'Azil on the slopes of the Pyrenees, and they can be followed like the trail of a paper chase from the Danube, across Europe, to North

Africa and the Sudan. The culture represented is thus called the Azilio-Tardenoisean ; it is post-glacial and marks the transition stage of the Palæolithic and Neolithic ages. The flints were found mainly on the moors of Rishworth and Soyland, and he and Dr. J. Grainger had picked up a few about a mile beyond the Derby Inn. Mr. Priestley also referred to the archaeological features of Ryburndale, and gave examples of interesting place-names among which the derivation of the present ' Joiner Stones ' from the Saxon ' Ionna Staner '—an inner place of holy stones—may be mentioned.

A hearty vote of thanks was accorded to the Local Secretary (Dr. J. Grainger) and to the several leaders whose names are mentioned above, as well as to the Wakefield Waterworks Engineer (C. Clemesha Smith, Esq.) and the L.M.S. Railway Co., for permission to visit their respective properties.

In a district so thoroughly worked not much new material was expected. In view of the inroads on nature made by the march of industry, a list of the plants actually seen on this date, contributed by Mr. E. Hallowell with the assistance of Messrs. Kaye and Fielding is worthy of being placed on record.

Flowering Plants.

| | |
|---|---|
| *Digitalis purpurea* | *Lapsana communis* |
| *Lactuca muralis* | *Galium palustre* |
| *Solidago Virgaurea* | *G. saxatile* |
| *Linaria cymbalaria* | *Stellaria uliginosa* |
| *Lotus minor* | *Ranunculus Lenormandi* |
| *L. major* | *R. Flammula* |
| *Hieraceum murorum* | *Senecio aquaticus* |
| *H. boreale* | *Vicia sepium* |
| *H. Pilosella* | *Vaccinium Myrtillus* |
| *Epilobium angustifolium* | *Empetrum nigrum* |
| *E. montanum* | *Leontodon autumnalis* |
| *Matricaria disciflora* | *Lonicera Periclymenum* |

To these flowering plants Mr. Hallowell writes, " I would like to add *Claytonia sibirica*, which has spread down the valley for many miles since its appearance probably some thirty years ago. I have no doubt what ever that the plant was thrown into the river at some point and immediately began to make itself at home along the banks.

Grasses.

| | |
|---|---|
| *Poa trivialis* | *Holcus lanatus* |
| *P. annua* | *H. mollis* |
| *P. pratensis* | *Nardus stricta* |
| *Agrostis vulgaris* | *Aira flexuosa* |
| *A. canina* | *A. caespitosa* |
| *Anthoxanthum odoratum* | *Cynosurus cristatus* |
| | *Alopecurus pratensis* |

Ferns.

| | |
|---|---|
| *Osmunda regalis* | *Aspidium felix-femina* |
| *Blechnum boreale* | *Ophioglossum vulgatum* |
| *Pteridium aquilinum* | *Lastrea dilatata* |

Fungi were scarce but among the small number collected, *Puccinia Conopodii-Bistortae* Kleb. on Bistort, found by Mr. W. P. Winter, is an addition to the flora V.C. 63. *Lentinus lepideus*, growing on the creosoted timbers of the platform at Sowerby Bridge Station, was collected by Miss D. Wooff. The mould *Monilia alphitoides*, on Oak, was very prevalent in the district.

I am indebted to Mr. Farnes, one of the resident engineers at Rishworth, for the photograph of the Dam which accompanies this report.

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# The NATURALIST

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OCT 29 1933
NATIONAL MUSEUM

## A MONTHLY ILLUSTRATED JOURNAL

PRINCIPALLY FOR THE NORTH OF ENGLAND.

*Edited by*

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**The University, Leeds.**

*with the assistance as referees in special departments of*

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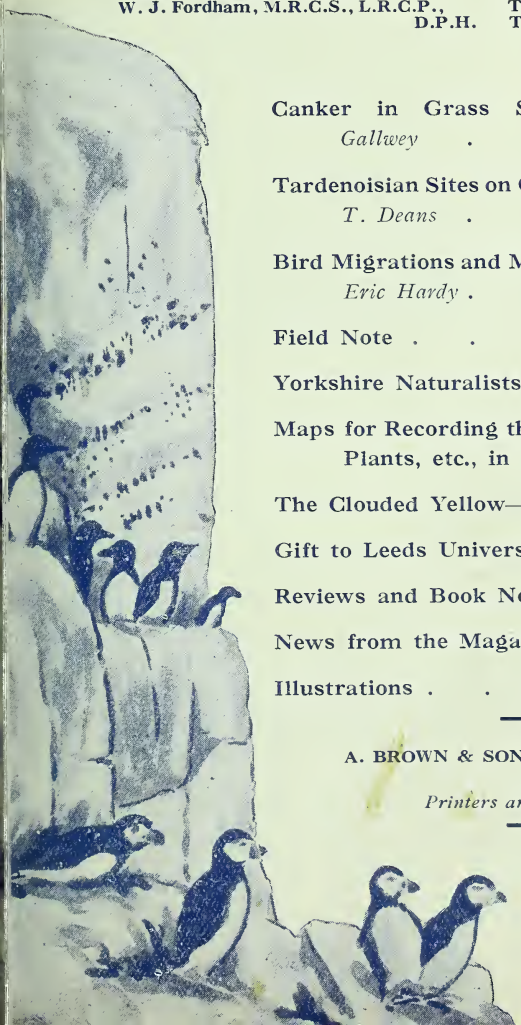

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# YORKSHIRE NATURALISTS' UNION.

## BOTANICAL SECTION.

THE Annual Meeting will be held at Leeds University in the Botanical Department, entry by the Baines Door, on Saturday, October 14th, at 3-30 p.m.

Business to discuss the Annual Report and suggest Officers and Members for the various Committees.

In the evening a paper will be read by Dr. Pearsall on 'Light and Plant distribution in Lake Windermere.'

Miss Scott will demonstrate 'Hydrotictyon reticulatum.'

CHRIS. A. CHEETHAM.

## ENTOMOLOGICAL AND PLANT GALLS SECTIONS

THE Annual Meeting of these sections will be held on Saturday, October 21st, in the Church Institute, Albion Place, Leeds, at 3 p.m. and again at 6 p.m.

Members are requested to bring exhibits.

AGENDA :—

| | |
|---|---|
| 3 p.m. to 5 p.m. | Exhibits. |
| 6 p.m. to 7-30 p.m. | Nominations of officers and consideration of reports. |
| 7-30 p.m. | Two short papers : (1) 'Some points in the Anatomy of the Psocoptera,' by J. M. Brown. (2) 'The Classification of the Weevils, with special reference to the Britannic species,' by W. D. Hincks. |

W. D. HINCKS, *Hon. Secretary*,
46 Gipton Wood Avenue, Leeds, 8.

## VERTEBRATE SECTION.

Two meetings will be held in the library of the Church Institute, Albion Place, Leeds, on Saturday, October 28th, 1933.

At 3-15 p.m. to consider and pass (*a*) Sectional Reports for 1933 and to elect Officers for 1934 ; (*b*) The General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee for 1933, and to recommend this Committee for 1934 ; (*c*) The Reports of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1933, and to recommend this Committee for 1934.

At 6-30 the following papers will be given :—

'Glimpses of Wild Bird Life' (Cinematograph Film), by W. F. Fearnley.

'The Merlin and other Moorland Birds' (illustrated), by Rennie Wood.

'A Dismal Swamp and its Avian Problems' (illustrated), by W. G. Bramley.

Members and Associates are cordially invited to attend and to bring notes, specimens and lantern slides. Will Officers of Affiliated Societies kindly notify their members?

E. WILFRED TAYLOR, *Hon. Secretary*,
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## WANTED

*Proceedings of the Yorkshire Geological Sociey.* Vol. XIII, pt. ii, pp. 134-278, 1896-7. R. G. S. Hudson, The University, Leeds.

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# CANKER IN GRASS SNAKES.

ELLEN GALLWEY.

THE cause of canker is still unknown, but it appears to be brought about by the lack of something in captivity which a snake is able to obtain in its wild state, for no one has ever caught a wild specimen suffering from this usually fatal

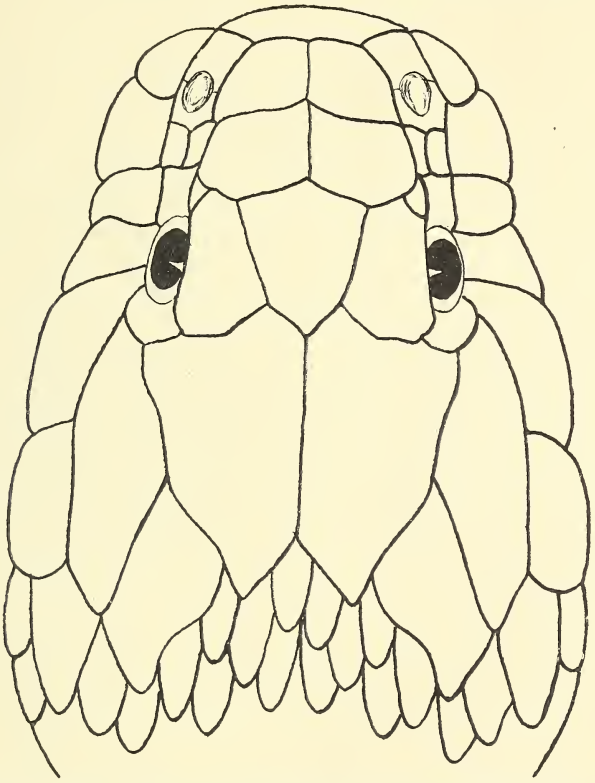


**Fig. 1. DORSAL VIEW OF THE HEAD OF THE GRASS SNAKE (×4). shewing the upper jaw greatly swollen due to canker.**

disease. Tomasini does not consider the disease infectious, and lays its cause to a lack of moisture in the snake's hiding place, but Ditmars[1] believes it to be brought about by an enervated condition of the snake, robbing the blood of its germicidal qualities—and this during a period of a disordered stomach. As the mouth of a snake that is not feeding becomes

[1] Ditmars, Raymond L., ' Reptiles of the World,' New York, 1930.



OCT 19 1933

stored with stagnant salivary secretions and as bacteria of many kinds always exist in the mouth due to the nature of a snake's food, this is the region attacked. A slight sore—a bruise caused by striking at an annoying object, or a wound received during the swallowing of living prey—is generally the start of the trouble. The sore becomes at once affected, and an intense irritation attended by a secretion of white cheesy flecks follows.

Mr. J. Burtscher[1] records that the bacillus found in canker is about the size of that of typhoid fever and appears abundantly as a diplobacillus, and both that and the single bacillus show capsule-formation. The bacillus is very mobile, and stained by the Van Ermengen method shows from five to twelve peripherally disposed flagella. The colonies are rounded with sharp edges, slightly raised, and show a faint irridescence seen against the light. It is highly pathogenic for cold-blooded animals and probably should be classed in the group to which *Bacillus fluorescens liquefaciens* Flügge belongs.

From my own observations I do not consider canker infectious. During the winter 1931-32 ten adult Grass Snakes (*Tropidonotus natrix*) were hibernating coiled together among *Sphagnum* moss, and periodically I carefully raised the moss to see that the snakes were all right. In February I found one dead and a second dying, which I painlessly killed. I dissected both these snakes, which were in a similar condition. The stomachs contained a reasonable amount of food, bearing in mind their long fast, but the mouths were absolutely full of canker slime, and that of the dead snake gave off a disagreeable odour. These facts indicate that canker was the cause of death. The first snake must have been dead about three days, so that most probably it had had canker a few weeks before death, yet none of the others were even slightly affected, nor did any develop it subsequently although they all drank from and bathed in the same water.

On 15th August, 1932, I caught a male Grass Snake (*Tropidonotus natrix*) which measured 3 feet 4 inches in length on the Lindholme Estate, Doncaster. This snake was kept with others of the same species in a cage in a glass-house facing south, at my home in Long Lane, Dalton, Huddersfield.

On 11th March, 1933, two weeks after waking from hibernation, a minute white fleck appeared on the right side of the roof of this snake's (' Rasper's ') mouth. I removed the fleck immediately by gently bathing the mouth with

---

[1] Burtscher, J., ' Über die Mundfaule der Schlangen ' (Der Zoologische Garten (N.F.) Bd. 4, 1931), Leipzig.

swabs of cotton wool soaked in a solution of one teaspoonful boracic acid to one breakfast cup of warm water.

The following day three more white flecks appeared, one in the same place as previously, the second near the anterior end of the left dentary between the bone and the gum, and the third in the centre of the roof of the mouth.

Each day until 24th April I removed any canker ' spots ' and thoroughly bathed the mouth, inside and out, with a

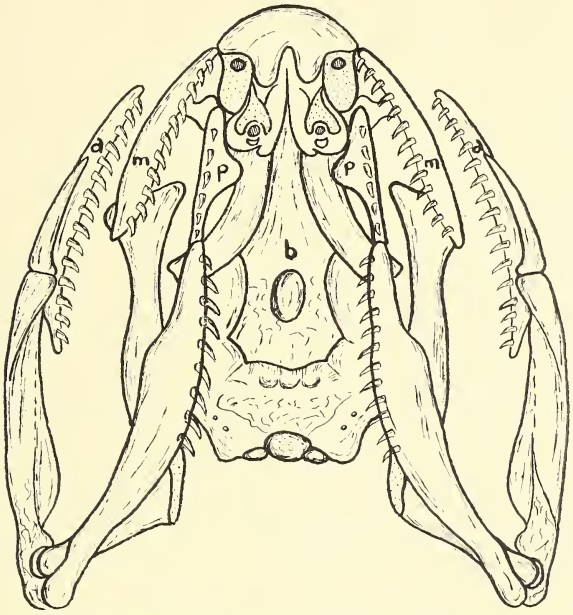



**Fig. II. VENTRAL VIEW OF THE SKULL OF THE GRASS SNAKE** (×4). (*Tropidonotus natrix*).
*d* **Dentary.** *p* **Palatine.** *m* **Maxilla.** *b* **Basisphenoid.**

solution of two teaspoonfuls boracic acid to one breakfast cup water, paying special attention to the teeth, but this treatment only held the disease in check. On the 24th I changed the mouthwash from boracic acid solution to a weak solution of permanganate of potash and used it once a day until the 28th when the snake escaped. Later in the day Rasper was found sunning himself on a wall in the hottest part of the garden, and standing nearby, staring at him with glassy eyes and wet hair standing on end, was a young black cat.

Up till now Rasper had never looked or behaved as if he were sick. The fresh air and direct sun had made him even more lively than usual, and he certainly showed his disapproval of being taken back to his cage.

The permanganate of potash solution barely kept the canker in check, the canker alternatively losing, but more often gaining, ground. By the end of April the sides of the upper jaw were much swollen due to two well-established canker ' colonies ' between the right and left maxilla and their respective gums. See figure I. The mouth could not be properly closed and there was a gap of about one-eighth inch between the upper and lower jaws. In habits Rasper was normal, until this time.

At the beginning of May Rasper usually held his head about one inch above the floor of his cage when resting, and continually worked his jaws as if chewing and swallowing. This produced the effect of blowing out his ' cheeks,' then trying to chew like a teething baby.

By 21st May canker had rapidly gained the upper hand. The characteristic slime was now almost covering the

**Fig. III. LOWER JAW OF THE GRASS SNAKE (×4).**
**shewing naked dentary protruding from the gum.**
*s* **Skin.** *d* **Dentary.** *g* **Gum.** *c* **Seat of Canker.**

membranes of the mouth, even the tongue sheath. Particularly bad seats of canker were opposite the centre of the basisphenoid, around the anterior end of each dentary, at the front between the gum and maxilla at each side, and in three places on the gum between the teeth on the outer side of the right dentary. See Fig. II.

Each day I removed the slime and thoroughly bathed the mouth with swabs of cotton wool soaked in a dark purple solution of permanganate of potash. However, the above-mentioned seats of canker were so deep and persistent that I was obliged to scrape the slime away with a fine scalpel, and afterwards wipe the places with tiny pieces of cotton wool held in fine-pointed forceps. The mouth meanwhile was kept open with a plug of saturated cotton wool.

This state continued, apparently getting no better, until early June, when Rasper only seldom put out his forked tongue, and began to wince when I touched his worst places.

By 20th June both dentaries were protruding, naked, from the gum, and beneath and all round each was a persistent ' growth ' of canker. See Fig. III. I was bitterly disappointed and grieved, and felt I was waging a losing battle

and paining the snake. I thought of killing the poor reptile, yet I was very attached to it, as well as interested in the disease, and moreover, as he was such a fine specimen I decided it was worth while doing everything possible to save him, although it looked absolutely hopeless.

I made the permanganate of potash solution stronger still, putting a good ' pinch ' of crystals into a teacupful of lukewarm water and by 3rd July all canker slime had disappeared. Four stubborn, well-established places only remained and the whole front of the lower jaw was out of shape. The skin sagged an eighth of an inch and the naked dentaries protruded. The other two places were between the right maxilla and gum and in the centre of the basisphenoid.

On 4th July the teeth began to fall from the front of the right maxilla, and the bone seemed to be softening, almost

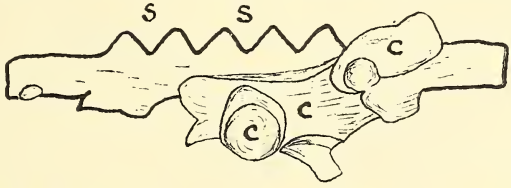



**Fig. IV. PORTION OF THE RIGHT MAXILLA (enlarged) shewing the empty teeth sockets (*s*), and cankered tissue (*c*) attached, removed on 8th July.**

as if necrosis were setting in. On 8th July this piece of bone seemed quite dead, and as well as canker in the surrounding flesh, there was great inflammation. The surrounding tissue was also very soft, and I realised that as it was I could not get rid of the disease. Gently, with the tip of a fine scalpel and long, fine-pointed forceps, I removed ·65 cm. of the front of the now partly toothless maxilla as shewn in Fig. IV. A little adhering flesh and canker, which seemed to have attacked the bone itself, came away with it, and then I thoroughly cleaned and bathed this bleeding wound, first with warm water which had been boiled only, and then with a very strong solution of permanganate of potash. In the same way I bathed below and around the two dentaries, and, after cleaning, the centre basisphenoid. Into each wound I placed two or three permanganate of potash crystals. These stained the whole of the interior of the mouth and saliva a deep brown colour, and the snake promptly began its ' chewing ' habit again. At first Rasper raised his head erect, then assumed a more normal pose, and one hour later he appeared quite comfortable and normal again.

Each evening from 8th July to the 14th I bathed the wounds with a very strong solution of permanganate of potash,

and placed two or three fresh crystals in each of the four ' wounds.'

From the time I began to apply solid crystals to the wounds, the canker began to subside with the sole exception of the deep-seated part in the anterior end of the right palatine. This bone shewed the same symptoms as the part of the right maxilla which I had to remove.

On 14th July I removed .55 cm. of the right palatine with a little soft flesh and canker attached. See Fig. V. This wound was treated exactly like the last, and from this time there was never a return of canker anywhere in the mouth, the impression being that the crystals of permanganate of potash were too strong for the canker bacillus.

Naturally, Rasper's mouth was stained deep brown, but apart from that it was healing beautifully. Gradually less and less dentaries were shewing, and on 27th July the right

**Fig. V. RIGHT PALATINE (enlarged) with a little cankered tissue (*c*) attached, removed on 14th July.**

one was quite normal again—no naked bone visible—and the snake was able to close his mouth. The wound caused by the removal of part of the right maxilla was also completely healed, and the snake only seldom chewed. He was more active, and frequently lay about on the grass, basking in the sun with his long, slender tongue flicking in and out. Rasper was quite normal and when I approached he pushed his cold nose into my hand for his accustomed stroke, then slowly lowered it until it rested flat on the grass where he would keep it for as long as I would stroke him.

He often darted in and out of his bath, and cast his skin in the end of June, July and August, signifying his good condition. Throughout his long illness, Rasper was fed each Sunday and Thursday with one raw hen's egg.

On 2nd August I discontinued all mouth washes, and there were no more signs of canker.

By 20th August Rasper was completely healed, his mouth being spotlessly clean and of a healthy pinkish hue.

There have been no signs of the return of canker, and the snake is now enjoying his natural food of frogs, toads and mice.

# TARDENOISIAN SITES ON OXENHOPE MOOR.

T. DEANS.

In a general survey of the Mesolithic sites of the North of England, Dr. A. Raistrick[1] refers to sites on Oxenhope Moor recently excavated by the writer. The present paper is intended as a detailed account of these sites, while for their relation to the other Pennine sites reference should be made to Dr. Raistrick's paper.

The two sites occur on the prominent "edge" which runs from Nab Hill, 1473 ft. O.D., eastwards for nearly a mile to Hambleton Top, 1,375 ft. O.D., on Thornton Moor, and which forms the northern edge of the high moorland plateau of the Aire-Calder watershed. Little is known of the distribution of flints on these moors on account of the thick peat which covers the rock surface on which they occur. A general examination of all exposures, however, seems to point to a concentration around the edge of the moor, rather than on the interior of the plateau. Their distribution, working from the Airedale edge northwards and returning on the Calderdale edge, is as follows :—

1. Odd finds in the peat pits N. of Ogden Kirk, at 1,300 ft. O.D.
2. Odd finds along the moor edge above Thornton Moor Reservoir.
3. A workshop site on Hambleton Top at 1,360 ft. O.D.
4. Odd finds in Deep House Delph and along the edge to Little Clough.
5. A workshop site between Great Clough and Wildman Lane, at 1,400 ft. O.D.
6. Odd finds on Nab Hill, where also Mr. W. Almond has found three workshop sites, which, however, have not been rediscovered.
7. Odd finds in Fly Delph and along Cold Edge, where also flints were recorded by Davis[2] over fifty years ago.

The Hambleton Top site lies at the end of a small wall about 60 yds. W. of the footpath to Ogden. The peat has here wasted away in patches and groups of flints were exposed on the loose sand. Further excavation by digging exposed a densely packed workshop floor of chert and a few more scattered flints. About 500 pieces of chert, large and small, were collected from the floor, but the proportion of tools was very small indeed. The finds are described below, the numbers referring to fig. 1, kindly drawn by Mr. J. G. D. Clark. About thirteen cores, those of the finer chert being worked to less than an inch in length. A series of seven tools made from thick irregular fragments or broken cores, with one edge worked straight, suggesting a use either as scrapers or pressure tools (*e.g.* Nos. 2 and 4). A few scores of broken blades, a

few whole blades, unworked, and three or four worked blades. Of the latter (No. 5) is worked on one side and the end, while (No. 6) has been notched. There are four pygmy points (Nos. 19 and 20) being well-made trapezoids, while (Nos. 17 and 22) are crude and unfinished. There is a single minute micro-burin (No. 14). Perhaps the most interesting tool is the large burin (No. 1). It is of the gouge type, and conforms most closely to the single-polyhedric pattern. It has been resharpened at least once, as indicated by the stepping on the graver facets on both sides, and the base has been worked as a scraper, but has been broken at the corner. It should be noted that while occurring in a Tardenoisian floor this tool is of perfect Upper Palaeolithic type.

The scattered flints total less than a quarter of the bulk of the chert, but the proportion of implements and blades is much larger. They include six cores (*e.g.* No. 3) ; a large rough scraper, notched, and with indications of long use ; many unworked blades and five worked blades ; a good batter-back blade (No. 8) ; and three pygmy points of sub-triangular form (*e.g.* Nos. 15 and 16).

The cherts and flints all occur in the thin sand, here varying from one to eight inches in thickness, underlying the peat and resting on the sandstone floor (Rough Rock Flags). In the chert floor the cherts occurred at the very top of the sand and often projected into the sandy base of the peat, so that when the peat was ripped up in excavation the cherts often came with it. At the base of the sand, stems and roots were found and identified by Dr. Woodhead as birch, but it was impossible to tell whether they had been introduced by the chert workers or had grown there previously. The chert is of more than one type ; the best is a shining compact chert of lead-grey colour, slightly bluish ; there is also much coarser light-grey chert and a little black and brown. There is nothing to indicate its source, and while it might be found within ten miles to the N.W., the use of chert in the Huddersfield sites might equally well suggest importation from North Derbyshire. As, however, chert implements are rare in the Yoredale country where chert beds abound, a southern origin appears more likely. The flint is mostly light brown and shows a slight patination in the form of grey-white mottling.

The Great Clough site occupies the only patch of rock surface exposed between Great Clough and Wildman Lane. This patch was less than 10 sq. yds. when discovered, but has been extended by excavation. While the flints were fairly numerous it is still doubtful whether the main workshop floor has yet been uncovered. Flint is here the more abundant material, chert only forming a third of the total.

The flints include only three cores ; about a dozen blades, half of which are worked (*e.g.* No. 7) ; three batter-back

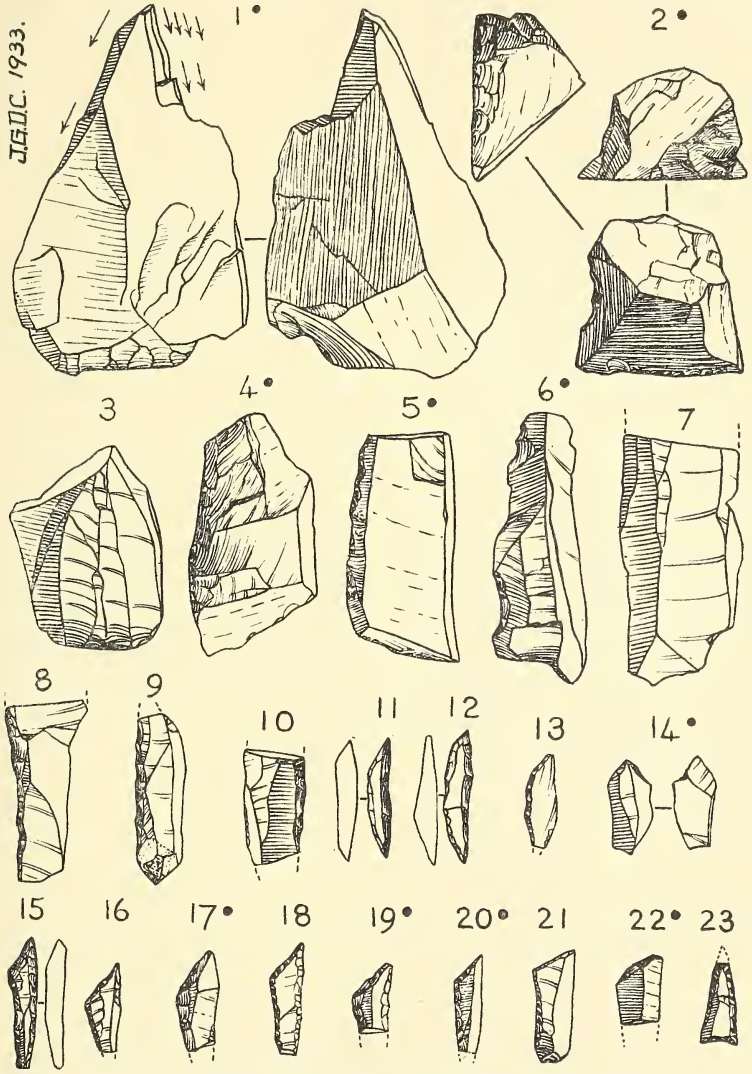



**Fig. I. IMPLEMENTS FROM OXENHOPE MOOR SITES.**
**Nos. 1-6, 8, 14-17, 19, 20, 22, from Hambleton Top. Nos. 7, 9-13, 18, 21, 23, from Great Clough.**
• Indicates chert, otherwise of flint. Scale approximately natural size.

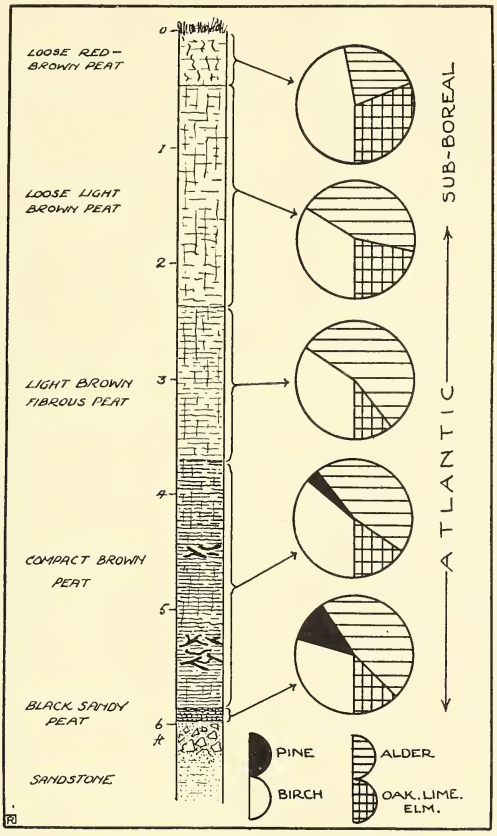
blades (*e.g.* Nos. 9 and 10) ; a large worked blade, broken ; a tool suggesting a borer ; six pygmy points and a fragment of a small geometric tool. The points show an interesting

variety of forms : (Nos. 18 and 21) are trapezoids ; (Nos. 11 and 12) are pointed at both ends ; (No. 13) is crescentic ; and (No. 23) is of the hollow based type, rare but characteristic of the Geometric Industry of the Huddersfield District.[3] The cherts include four cores and four blades, three of which are worked, and a small point of the trapezoid type. Two large fragments of rather poor chert show worn surfaces, indicating that they were picked up from river or glacial drift, such as could be found less than a mile from the site, which, however, stands on the nunatak. Numerous small fragments of flint were found, which were whitened and cracked by fire. The material here varies from clear light-brown flint, showing no sign of patination, through mottled types, to densely patinated flint, the two extremes being present in equal proportions. The horizon of the flints appears to be the upper part of the clayey sand which grades imperceptibly into the weathered micaceous sandstone underneath.

The characters of the finds at the two sites are similar, and it is probably safe to assume that they belong to the same industry and period. Of the two Mesolithic Industries of the Pennines, the Geometric or Narrow Blade and the Non-Geometric or Broad Blade industry, the present sites, with fairly abundant geometric points, relatively thick narrow blades, and an absence of obliquely truncated points, clearly belong to the former. In the Huddersfield district a further sub-division into an early and a late period, indicated by the predominance of the angle-graver or the micro-graver respectively, has been suggested. This classification, however, cannot be applied to the Oxenhope sites, where, in common with the other known sites of Airedale and Wharfedale, gravers are not at all common. The implements themselves give no conclusive evidence as to their period as compared with other Pennine sites. The pygmy points alone show an association of types which might be used for comparative purposes, but such a comparison would demand a much wider experience than the writer's.

The Tardenoisian culture of the North of England is correlated with the Boreal Period,[4] and the evidence from Oxenhope Moor supports this view. In connection with the pollen analysis of the North of England peats,[5] a section of the peat was taken in Nab Hill Delph and examined by Dr. Raistrick ; the results are shown in his diagram, fig. II. The tree pollen frequency was low, as might be expected at such an exposed summit, but the spectra show the normal succession of the Pennine peats. The base is of transitional period between the Boreal and Atlantic, and so the Tardenoisian layer must be assigned to the Boreal period.

While the level of the implements in the sand cannot be used in any strict stratigraphical sense, the fact that at Hambleton Top the chert projected into the sandy basal peat would suggest that the occupation was followed closely by the formation




of peat, and so date the sites as late Boreal or even Boreal-Atlantic transition.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# BIRD MIGRATIONS AND MOVEMENTS INSIDE LIVERPOOL.

ERIC HARDY

THE cry that the spreading of houses and suburbia is driving all our birds out of town, and to decreasing numbers, is one that needs contradiction, and particularly that type of accusation that declares the inner streets of big cities, and especially the slums, are devoid of all variety of wild birds as permanent visitors, with the exception of the inevitable Cockney house sparrow and a certain number of starlings and domestic pigeons.

Observations one has carried out at a birds' sanctuary formed in the middle of Liverpool slums and some eight miles from open country, reveal many interesting sidelights on the way birds are taking to city conditions, despite the city building new housing areas on its outskirts more than any other town, and the varying ways of birds in a big city. No doubt, for mere pleasure a bird sanctuary would be more profitable in a country valley than a city slumland, but the conditions under which the present sanctuary is situated might be described as almost unparalleled for the study of the way birds take to city conditions. The Liverpool Cathedral Wild Birds' Sanctuary was established in the St. James' Cemetery, a disused quarry about fifteen hundred feet in length and about one hundred yards in width, in the spring of 1927, when berry-bearing bushes were planted, and nest-boxes, feeding-tables, drinking and bathing fountains were established, there already being a natural spring in the cemetery, and two copses of trees, mostly elder and rowan, at each end. Since then, food of typical bird-sanctuary kind, bread crumbs, nuts, fruit, bacon rind (as much as three pounds on winter days) of about ten pounds, is placed on the tables each morning and afternoon. The sanctuary is surrounded by dense slums and is a mile from a city park, forming the only natural bird attraction in the centre of the city, where it acts as a trap or lure to migrating birds and those roaming about the city.

As soon as the sanctuary was established there began a noticeable change in the bird life of the cemetery, and one made regular observations, and when recently this effect was visible on the bird life of the neighbouring streets, one undertook a day-to-day census during autumn, winter and early spring, when the numbers of all birds with the exception of house-sparrows, were counted, especially after a sudden change in the weather, and note kept of the temperature, direction of wind, humidity and the rising or falling of the barometer. In no case was a bird-count preserved when there was any noticeable range of doubt in the number.

During the winter months, starlings ranged from 57 to 85 ; robins, blackbirds and wrens remained constant at 4, 5 and 4 respectively ; blue tits varied from 3 to 7 ; hedge-sparrows, 5 to 16 ; song thrushes, 4 to 10 ; chaffinches from 1, 2 or 4, or often none at all, to 30 ; greenfinches, 36 to 65 ; linnets, varying up to about 4. At the time of writing, I have recorded 31 species in the sanctuary, consisting of the redbreast, blue tit, house-sparrow, hedge-sparrow, starling, song thrush, domestic pigeon, wren, blackbird and greenfinch, as regular nesters ; great tit, missel-thrush, occasional nesters ; chaffinch, linnet, rook, jackdaw, herring and common gull, regular winter visitors ; redwing, nuthatch, pied wagtail, kestrel, cole tit, yellow hammer, tawny owl, occasional visitors ; and willow warbler, chiffchaff, whitethroat, goldcrest, visitors on migration.

In the day-to-day census, the starling figures showed the first falling off when the winter visitors left on March 14th, when the temperature had steadily risen from 36° F. on February 23rd, to 49° and continued to rise after. The wind on that day was W.S.W. after previously being E.S.E., and on many counts before that, in February, N.N.W. and W.N.W. at the beginning of the month. The humidity was slightly lower than average at 77 per cent., and the barometer steady at 30.14. That day the starlings dropped from 72 to 47 ; a week later they numbered 21 ; three days later, 20 ; and on the 30th, 17. By April 4th, they had reached 9, and later, one or two passage birds, including a part albino, passed through and perhaps affected the counts, but three pairs remained behind to nest. The greenfinch flocks began to show signs of moving out of the city on March 30th, when the wind had changed from E.S.E. to W., and later to W.N.W., and the barometer rising at 29.97, humidity being 82 per cent. The flock numbered had dropped from 65 to 36, and on April 4th to 33, and two days later to 20. Thereafter most of the residents were nesting, about six to eight pairs, and only cock birds in song could be counted safely in the increasing burgeoning of the foliage.

The willow warblers call in on migration through the city in May, and sometimes stay a day or two in the shrubberies. The goldcrests (first noted in 1931) are now regular passage migrants in ones or twos in March, whilst at the end of the nesting season there is a regular passage through of young willow-warblers, which stay longer than the spring migrants. Pied wagtails and other birds call in after crossing the Mersey and making through the city to open countryside, and possibly meadow pipits pass through on the early spring migration north from the winter quarters in France and Spain. I have watched this passage through the city on the lawns at St. John's Gardens, not far away, in March, but have been too

busy to go down to the sanctuary. The redwings come in in hard frost in winter, while most of the missel thrushes, great tits and many blue tits call in while roaming about the city ; a small flock of missel thrushes comes about September for the berries. Blackbirds and wrens seem little addicted to city street roaming.

In the hard frosts it was found that the need for water, and not food, drove the birds into city streets, and territory rights in the sanctuary were forgotten, birds flocking together at the water. The greenfinch takes to city conditions much more quickly than the chaffinches and linnets which only come in in winter and so far cannot be induced to nest. Since the sanctuary was started, the size of winter flocks of greenfinches has increased, and in 1932 two or three pairs stayed behind to nest and more did so in 1933. The greenfinches can now occasionally be seen in the neighbouring slums feeding on the manure in the streets, a common habit with city birds, with the sparrow flocks. Odd starlings, possibly the nesters, slept in holes in trees in the winter, but many of the birds roosted at a 25,000 bird starling roost on the edge of the city at Childwall, a little over three and a half miles S.S.E. The young starlings begin to flock in the sanctuary in early June, but do not leave, all the starlings, summer and winter, keeping to a well-wooded slope near the corner of food-tables, which we have named ' Starling Town.' A cinnamon song thrush and many partly white sparrows have been noted.

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**Cumberland Diptera.**—These recent captures of Diptera supplement the short list in *The Naturalist* for 1931, p. 138. Flies without definite locality were taken last June in a grassy lane bordering a large wood some distance south of Longtown. *Chrysopilus auratus* Fab. scarce. *Tachydromia pallidiventris* Mg. common. *T. nigritarsis* Fln. Todhills 26/8, uncommon. *Rhamphomyia longipes* Mg. (*æthiops* Zett.) rare. *Empis æstiva* Lw. fairly frequent. *Phyllodromia melanocephala* Fab. a common fly. *Dolichopus angulatus* Linn (*æneus* Drg.) rather rare. *D. plumipes* Scop. common. *Hercostomus nigripennis* Fln. common. *Gymnopternus ærosus* Fln. common. *Syrphus cinctellus* Zett. Todhills 26/8 not rare. *Pipunculus xanthopus* Thoms. Todhills 19/8, several specimens. *Psila pallida* Fln. not common. *Nemopoda cylindrica* Fab. Todhills 26/8 very common. *Phytomyza flava* Mg. Todhills 26/8 abundant. *P. milii* Kalt. one. *Oscinis pusilla* Mg. fairly plentiful. *Hydrellia incana* Stenh. common. *Borborus equinus* Fln. Sark Bridge 23/2, a very common fly about horse manure. *Drosophila transversa* Fln. Todhills 26/8 not uncommon.—Jas. Murray, Gretna.

# YORKSHIRE NATURALISTS IN THE RIPON DISTRICT.

The 378th Meeting was held at Ripon during the Bank Holiday week-end, August 5th to 7th. The attendance was smaller than the average for the meetings of the year, but a considerable amount of work was accomplished, particularly by the Freshwater Biology and Entomology Sections respectively. On Monday the forces of the latter section were augmented by the visit of Messrs. J. R. Dibb, W. D. Hincks and M. L. Thompson. As the date coincided with about the middle of the long drought experienced during this summer, conditions were not ideal for field work and it was fortunate that with the exception of an excursion scheduled for Brimham Rocks, the routes planned for the week-end were confined to the banks of streams, or to the vicinity of open waters like Eavestone Lake and Lumley Moor Reservoir.

Evestone Lake and the valley of the Skell to Grantley provided a very full day on Saturday. The ' lake ' is really a reservoir for the water supply of Grantley Hall, which has been constructed on the site previously occupied by a glacial lake. It is, nevertheless, a very beautiful sheet of water in picturesque surroundings situated at the eastern extremities of Pateley and Eavestone Moors. As described by Kendall and Wroot : ' Several landslips have interfered with the simplicity of its form, but the huge slipped masses of rock and pine with which the bank is planted give something of the air of a Swiss hillside far more impressive than the bare 200 feet of height would warrant.' Mr. C. Allen, with the assistance of Mrs. E. M. Morehouse, collected information relating to the biological aspects of the lake, while Mr. W. P. Winter, B.Sc., made a series of observations on the physical and chemical natures of the standing and inflowing waters. Despite the general dryness of the woods there was sufficient humidity to permit the development of the fleshy fungi and a good collection was made which included no fewer than ten species of Boleti.

Lumley Reservoir, the property of Ripon Corporation, was visited on Sunday, and its low state was a favourable circumstance rather than otherwise, as it gave an opportunity for close investigation of the banks down to the rock at low water level, and a good deal of interesting botanical work was done, as reported by the President. This visit followed the excursions to Sawley and Pickin Gill made earlier in the day. At the latter place several large nests of the Wood Ant were an interesting entomological feature of the bracken-covered edges of the lake, and the number and diversity of the insects being carried to the nests by the ants gave the impression that the latter were expert and very successful rivals of the entomologists present in the party.

The investigation of Spa Gill Woods occupied the greater part of Monday. Here, at the head of the Gill, the sulphur springs were examined and their waters sampled dietetically. Some of this water is pumped to Ripon for Spa purposes, but at the time of the visit either an overflow from this or from another spring was running directly into the stream, and a number of observations on the effect of this addition on the life of the stream were made by Mr. Allen. Deposits of precipitated sulphur could be seen encrusting the rocks, stones and vegetable matter for a considerable distance downstream from this point. The lower reaches of the Skell, through Mackershaw Wood, scheduled for examination on this day were not visited until Tuesday when a small party, under the leadership of the President, completed a programme which might with advantage be repeated at no far distant date some two months earlier in the year.

On Monday evening a General Meeting was held at Headquarters, the President (Mr. J. M. Brown, B.Sc., F.L.S., F.R.E.S.) occupying the chair. Reports were made on the fresh-water biology of the district

by Mr. C. Allen and on the physical and chemical nature of the local streams by Mr. W. P. Winter, B.Sc., while the President added remarks on their entomological features. Mr. Winter also reported on the geology of the area investigated, Messrs. J. R. Dibb, H. D. Hincks, M. L. Thompson and the President on entomology, while botanical aspects were dealt with by the President, Mr. W. P. Winter, and Mr. F. A. Mason.

A very hearty vote of thanks was accorded to the Local Secretary (Mr. Riley Fortune) for the very satisfactory arrangements of the week-end excursions and a vote of thanks was also passed to the local land-owners for courteous permission to visit their properties. The President, on behalf of the meeting, expressed his thanks to the Hon. Secretary (Mr. F. A. Mason) for the use of his car, without which it would not have been possible to carry out the programme so completely as had been done.

Fungi (Mr. F. A. Mason) :—A considerable number of agarics and boleti rewarded the keen collecting of Miss L. M. Anderson and Miss Kathleen Morehouse, and Messrs. R. Fowler Jones, J. L. Illingworth and A. Aikman. The Eavestone and Spa Gill excursions yielded most of the larger fungi recorded in the following list, with the exception of those marked 'M,' which were collected in Mackershaw Wood by Miss Morehouse and Mr. Jones. The Pickin Gill gatherings duplicated the species found at Eavestone.

*Amanita rubescens*
*A. verna*
*Amanitopsis vaginata*
*Russula virescens*
*R. cyanoxantha*
*R. fellea*
*R. subfoetans*
*R. fragilis*
*R. emetica*
*Collybia radicata*
*C. platyphylla*
**Mycena rubromarginata*
*M. galericulata*
*M. alcalina*
*M. tenella*
*M. sanguinolenta*
*M. cruenta*
*M. galopus*
*M. discopus*
*Marasmius erythropus*
*M. oreades*
*M. hariolorum*
*M. ramealis*
*Androsaceus rotula*
*A. graminum*
*Lactarius turpis*
*L. vellereus*
*L. deliciosus*
*L. quietus*
*L. rufus*
*L. subdulcis*
*L. serifluus*
*Laccaria laccata*
*Omphalia umbellifera*
*O. fibula*
*Pleurotus ostreatus*
*Pluteus cervinus*
*Entoloma sericeum*
*Bolbitius fragilis*
*Inocybe rimosa*
*I. geophylla*
*Asterosporina asterospora*
*Naucoria cucumis*
*Galera tenera*
*G. hypnorum*
*Tubaria furfuracea*
*Cortinarius* (Phleg.) *cyanopus*
*C.* (Ino) *violaceus*
*C.* (Tela.) *hinnuleus* (M)
*Crepidotus versutus*
*Psalliota sylvicola*
*Stropharia squamosa*
*Anellaria separata*
*Gomphidius viscidus*
*G. roseus*
*Panæolus subbalteatus*
*Psathyrella atomata*
*P. disseminata*
*Psathyra corrugis*
*Psilocybe semilanceata*
*Coprinus atramentarius*
*Paxillus involutus*
*Tylopilus felleus*
*Boletus elegans*
*B. badius*
*B. bovinus*
*B. chrysenteron*
*B. subtomentosus*
*B. edulis*
*B. luridus*
*B. scaber*
*B. varieicola*
*Polyporus bumalis* (M)
**P. melanopus* (M)

* New record for Mid. W., V.C.64.

*Polyporus varius*
*P. squamosus*
*P. hispidus*
*Fomes ferruginosus*
*F. annosus*
*Poria sanguinolenta*
*Irpex obliquus*
*Fistulina hepatica*
*Acia uda* (M)
*Grandinia farinacea*
*Hypochnus fumosus*
*Stereum rugosum*
*S. hirsutum*
*S. sanguinolentum*
*Corticium comedens*
*Peniophora velutina*
*Clavaria cinerea*
*C. argillacea*
*Typhula erythropus*
*Tremella lutescens*
*Calocera viscosa*
*C. cornea*

*Phallus impudicus*
*Lycoperdon perlatum*
*L. pyriforme*
*Scleroderma aurantium*

A few dead insects bearing either parasitic or saprophytic fungi were collected and I am indebted to Mr. T. Petch for their examination. A fly (species undetermined) taken in the net by Mr. J. R. Dibb, was parasitised by *Empusa muscæ* Cohn. Miss K. Morehouse collected a number of specimens of dead flies at Eavestone which had been attacked by *Entomophthora americana* Thaxter, while the only fungus found among a mixed lot of insects from the district was *Mucor mucedo* on a Tipulid, on which, doubtless, it occurred as a saprophyte.

There were fewer Uredines than might have been expected, and those seen were mostly on the plants growing about Eavestone Lake or in the marshy fields traversed at the head of Spa Gill.

*Uromyces alchemillæ*
*U. valerianæ*
*U. rumicis*
*Puccinia epilobii* on Epilobium palustre
*P. zopfii* on Caltha
*P. menthæ*
*Puccinia obtegens*. *P. lapsanæ*
*P. eolii*
*P. poarum*
*Phragmidium subcorticium*
*Coleosporium tussilaginis*
*Melampsoridium betulinus*
*M. salicinium*

The ' smut,' *Entyloma ranunculi*, occurred on *Ranunculus repens* at Eavestone.

Microscopic fungi received but little attention, although they were present in plenty. In addition to the few species that could be identified in the field, material since examined has yielded a list containing some noteworthy species.

**Phyllosticta fraxinicola* Curr. On Ash leaves, Pickin Gill.
*P. saccardoi* Thuem., on Rhodendron, Eavestone.
*Phoma strobiligena* Desm., on Pine cones, Eavestone.
*P. samararum* Desm., on Ash samara.
*Cytospora ambiens* Sacc., on Hawthorne branch, Eavestone.
*Coniothyrium fuckelii* Sacc., on Rose stems, Pickin Gill and Spa Gill.
*Oidium alphitoides* Griff. and Manbl., on Oak leaves, widespread.
*Trichoderma lignorum* (Tode) Harz. Common.
*Verticillium agaricinum* (Link) Corda, on decaying toadstools, Spa Gill.
*Tricothecium roseum* Link, on rotting branches. Common.
†*Ramularia variabilis* Fuckel, on Foxglove leaves.
*Polythrincium trifolii* Kunze, on clover, banks of Lumley Moor Reservoir.
**Helminthosporium velutinum* Link., decorticated wood, Spar Gill Woods.
**Cercospora mercurialis* Passer, Mackershaw Wood.
*Fumago vagans* Pers., on Sycamore leaves, Spa Gill Woods.
*Tilachlidium tomentosum* (Schrad.) Lind., on old *Trichia* sp.

The Phycomycetes *Syzigites megalocarpus*, Ehren. and *Spinellus fusiger* van Tieg. occurred on *Amanita rubescens* and on *Mycena sangainolenta* respectively.

* New record for Mid. W., V.C.64. † New to Yorkshire.

The few Myxomycetes recorded included *Badhamia panicea*, *Physarum nutans* and *P. virescens*, *Fuligo septica*, commonly, *Comatricha nigra*, *Reticularia lycoperdon*, *Trichia varia*, *Perichæna depressa* and *P. corticalis*, *Stemonitis fusca* and *S. herbatica*.

The Discomycetes were not numerous or, at any rate, they were too dry and shrivelled to be recognisable. The species collected were mainly obtained in Spa Gill Woods and Pickin Gill. The species marked ' M ' were sent to me after the meeting, from Mackershaw Wood.

*Cilliaria scutellata*
*C. setosa*
*Cheilymenia stercorea*
*Coprobia granulata*
*Ascobolus stercorarius*
*Ascophanus carneus*
*Calycella citrina*
*C. claroflara*
*Coryne sarcoides*
*Bulgaria inquinans*
*Orbilia leucostigma*
*O. xanthostigma*
*Chlorosplenium æruginosum*, in fresh, fully-developed condition (M)
*Helotium herbarum*
*H. fructigenum*
*Dasyscypha virginea*
*D. nivea*
**D. ciliaris*, Spa Gill Woods
**D. diminuta*, Pickin Gill
*Trichoscypha calycina*
*Mollisia cinerea*, *M. melaleuca*
*Phacidium multivalve*
*Stegia Ilicis*
*Rhytisma acerinum*, *R. punctatum*

Other species among the Ascomycetes were the following :—
**Lophodermium pinastri*, Pine needles, Eavestone.
*Hysterographum fraxini*, Spa Gill.

*Hypomyces chrysosperams* on Boleti, Eavestone
*Nectria cinnabarina*, *N. ditissima*
*Hypocrea rufa*
*Epichloe typhina*
**Rhopographis pteridis* on Bracken, Eavestone Moor
*Phyllachora graminis*
*Endodothella junci*
*Melanomona pulvis-pyrius*
*Leptosphæria acuta*, *L. doliolum*
*Pleospora herbarum*
*Diatrype stigma*

Conchology (Mrs. E. M. Morehouse) :—The weather was not suitable for good results among the molluscan fauna, and a brief résumé gives the following results of the land species :—

Saturday : Woods round Eavestone Lake—1 mollusc.
Sunday : Pickin Gill—1 mollusc, 3 slugs.
Monday : Spa Gill Woods—4 molluscs, 2 slugs.

On August 2nd, Thieves Gill was visited, when eight species of molluscs and two slugs were taken. All the above areas were particularly dry.

On August 8th a small party of five members explored the Mackershaw Woods. Here they were able to give much more time to a small area, with better results ; hence the total of 17 molluscs, including two species of slugs, one of which was the very common *Agriolimax agrestis* (Linné), the only specimen of its kind seen during the week-end. Also :—

*Limax maximus* (Linné)
*Vitrea pura* (Alder.)
*V. radiatula* (Alder.)
*V. nitidula* (Drap.)
*V. rogersi* (Woodward)
*Vitrina pellucida* (Müll.)
*Euconulus fulvus* (Müll.)
*Pyramidula rotundata* (Müll.)
*Hygromia rufescens* (Penn.)
*H. fusca* (Montagu)
*Helix hortinsis* v. *quinquevittata*, 1, 2, 3, 4, 5 (Müll).
*Cochlicopa lubrica* (Müll.)
*Carychium minimum* (Müll.)
*Jaminea cylindracea* (Da Costa)
*Clausilia bidentata* (Strom.)
*C. laminata* (Montagu)

* New record for Mid. W. V.C.64. † New to Yorkshire.

At least two areas gave promise of good yield of species if it had not been so dry. It would be interesting if anyone living in the Ripon district could find all the molluscs reported in the Circular for 1905.

Flowering Plants (J. M. Brown) :—While no strikingly new finds were made, the district proved of great interest to the botanists owing to the abundance of flowering plants, and to the wealth of blossoms which with the sunshine experienced, combined to give colour and brightness to the woods and lanes. The routes followed, keeping mainly to the valleys and by the waterside, resulted in moisture-loving plants being the most obtrusive. Particularly noticeable was the abundance of *Epilobium angustifolium* L. and *E. hirsutum* L. (Rose-bay and Hairy Willow-herbs), which gave the dominant colour effect to stream sides and clearings, of *Mimulus luteus* L. by the waterside, and on the shores of Eavstone Lake, the extensive areas occupied individually by *Comarum palustre* L. (Marsh Cinquefoil), *Mentha verticillata* Huds. (Mint), *Iris Pseudacorus* L. (Yellow Iris), and especially by the luxuriant growths of *Scutellaria galericulata* L. (Skull-cap).

Of particular interest was the association of plants noted around the Lumly Moor Reservoir. Owing to the dry season the water level was low and a large area normally submerged had been left exposed. This strand was dominated in great part by *Littorella uniflora* Asch. (Shore-weed) plentifully in flower, but in places giving way to *Peplis Portula* L. (Water Purslane), also in flower, and to trailing growths of *Juncus bulbosus* L. Higher up the strand and in drier situations were limited patches of *Gnaphalium uliginosum* L. (Cudweed) and curiously stunted plants of *Oenanthe aquatica* Poir (Water Dropwort) probably representing material brought into the reservoir with the inflow. More landward still occurred *Achillea ptarmica* L. (Sneezewort), *Corydalis claviculuria* DC. and (as pointed out by Mr. Winter) specimens of *Plantago major* var. *intermedia* (Gil.). At the upper inflow, a damp area showed a characteristic bog association dominated by *Comarum palustre* L., *Menyanthes trifoliata* L. (Bog-bean) and *Mentha aquatica* L. (Water Mint), but including abundance of *Veronica scutellata* L. (Marsh Speedwell), *Hydrocotyle vulgaris* L. (Marsh Pennywort), *Lotus uliginosus* Schk. (Marsh Bird's Foot Trefoil) and *Galium uliginosum* L. (Bog Bedstraw).

The most abundant aquatics appeared to be *Potamogeton polygonifolius* Pourr. and *Myriophyllum verticillatum* L.

*Epipactis latifolia* Druce was seen plentifully in the Spa Gill Woods. *Equisetum maximum* Lam. was abundant, and *Botrychium Lunaria* Sw. was observed.

Entomology (J. M. Brown) :—In spite of what appeared to be particularly favourable conditions both as regards weather and locality, insects of most orders seemed distinctly scarce. Considering that the expeditions were mainly in the immediate neighbourhood of water, either as streams or ponds, the paucity of Stone-flies, Caddis-flies, Dragon-flies, and May-flies, whose larvae live in such places, was particularly noticed. Under such circumstances few rarities were taken. Hemiptera and Psocoptera seemed more numerous, and therefore most attention was given to these groups.

Beetles, butterflies, bees and wasps, and saw-flies were not much in evidence, but the Wood Ant (*Formica rufa* L.) was quite plentiful in Pickingill, where a large number of nests, composed as usual of pine needles, were noticed.

Plecoptera.—Very few Stone-flies were seen. Those taken were :—

*Isoptera tripunctata* Scop.
*Leuctra klapaleki* Kmpy.
*Leuctra geniculata* Steph.
*Amphinemura cinerea* Oliv.

Trichoptera were rather more numerous and included :—

*Glyphotaelius pellucidus* Retz.
*Drusus annulatus* Steph.
*Odontocerum albicorne* Scop.
*Leptocerus bilineatus* L.
*Tinodes waeneri* L.
*Plectrocnemia conspersa* Curt.
*Polycentropus flavomaculatus* Pict.
*P. multiguttatus* Curt.
*Agapetus fuscipes* Curt.

Odonata.—Several Dragon-flies were seen in the distance, but not identified.

Neuroptera.—Lacewing-flies were fairly numerous, especially in Spa Gill Woods and Mackershaw Woods, and included :—

*Chrysopa vittata* Waesm.
*Hemerobius humuli* L.
*H. marginatus* Steph.
*Hemerobius lutescens* Fabr.
*H. simulans* Walk.
*Boriomyia nervosa* Fabr.

Hemiptera.—Plant-bugs and Plant-hoppers seemed by far the most plentiful insects about, though none of great rarity were obtained *Stenotus binotatus*, generally rather scarce with us, was quite plentiful in Spa Gill Woods. Pines yielded *Acompocoris pygmaeus, Phytocoris pini, Dichrooscytus rufipennis, Lygus rubricatus* and *Atractotomus magnicornis* in considerable number. Among damp rushes *Cyrtorrhinus caricis, Cicadella viridis, Limotettix nigricornis* occurred plentifully and *Empoasca butleri* was also taken.

Heteroptera.—The following were taken :—

*Scolopostethus decoratus* Hahn.
*Velia currens* F.
*Reduviolus limbatus* Dahl.
*Anthocoris confusus* Reut.
*A. nemoralis* F.
*A. nemorum* L.
*Acompocoris pygmaeus* Fall.
*Pithanus maerkeli* H.S.
*Stenodema calcaratum* Fall.
*S. laevigatum* L.
*S. holsatum* F.
*Trigonotylus ruficornis* Fourc.
*Monalocoris filicis* L.
*Bryocoris pteridis* Fall.
*Phytocoris tiliæ* F.
*P. longipennis* Flor.
*P. pini* Kb.
*Calocoris sexguttatus* F.
*C. norvegicus* Gmel.
*Stenotus binotatus* F.
*Dichrooscytus rufipennis* Fall.
*Lygus pabulinus* L.
*L. viridis* Fall.
*L. pratensis* L.
*L. rubricatus* Fall.
*Lygus lucorum* Mey.
*L. cervinus* H.S.
*L. pastinacæ* Fall.
*L. kalmii* L.
*Liocoris tripustulatus* F.
*Dicyphus epilobii* Reut.
*D. stachydis* Reut.
*Campyloneura virgula* H.S.
*Cyllocoris histrionicus* L.
*Blepharidopterus angulatus* F.
*Mecomma ambulans* Fall.
*Cyrtorrhinus caricis* Fall.
*Orthotylus marginalis* Reut.
*O. ericetorum* Fall.
*Malacocoris chlorizans* Fall.
*Phylus melanocephalus* L.
*Psallus betuleti* Fall.
*P. variabilis* Fall.
*Atractotomus magnicornis* Fall.
*Plagiognathus chrysanthemi* Wolff.
*P. arbustorum* F.
*Notonecta glauca* L.
*Sigara nigrolineata* Fabr.
*S. striata* L.

Homoptera.—Those taken were :—

*Cercopus alni* F.
*Philænus spumarius* L.
*P. lineatus* L.
*Megophthalmus scanicus* Fall.
*Cicadella viridis* L.
*Euacanthus interruptus* L.
*E. acuminatus* Fabr.
*Bythoscopus lanio* L.
*Oncopsis alni* Schr.
*Aphrodes nervosus* Schr.
*Euscelis sordidus* Zett.
*E. plebejus* Fall.
*E. obsoletus* Kbm.
*Deltocephalus flori* Fieb.

*D. distinguendus* Flor.
*D. thenii* Edw.
*D. pulicaris* Fall.
*Jassus mixtus* Fab.
*Limotettix nigricornis* Sahl.
*L. 4-notata* Fab.
*L. sulphurella* Zett.
*Alebra albostriella* Fall.
,, var. *flaveola* H.S.
*Empoasca smaragdula* Fall.
*E. butleri* Edw.
*Eupteryx auratus* L.
*E. signatipennis* Boh.
*Eurhadina pulchella* Fall.
*E. concinna* Germ.
*Typhlocyba ulmi* L.
*T. quercus* Fab.
*Conomelus limbatus* Fab.
*Dicranotropus hamata* Boh.
*Psylla alni* L.
*Cixius brachycranus* Fieb.

Psocoptera.—These inconspicuous insects were quite numerous, and a good selection was obtained mainly by beating. The most interesting species taken, however, was discovered by searching among the stones by the shore of Eavstone Lake, where the peculiar wingless female of *Bertkauia lucifuga* was found. This species has occurred previously once only in the county, when I obtained it in Goredale last year, also below stones. The following species were taken :—

*Psocus nebulosus* Steph.
*Trichadenotecnum sexpunctatus* L.
*Amphigerontia bifasciata* Latr.
*Loensia fasciata* Fabr.
*Graphopsocus cruciatus* L.
*Stenopsocus immaculatus* Steph.
*Reuterella helvimacula* End.
*Bertkauia lucifuga* Ramb.
*Cæcilius flavidus* Steph.
*Peripsocus phæopterus* Steph.
*Mesopsocus impunctatus* Mull.
*Elipsocus cyanops* Rost.
*E. westwoodi* McL.
*E. hyalinus* Steph.
*Philotarsus flaviceps* Steph.

Collembola.—Very little attention could be given to these minute insects, but the following were noted in passing :—

*Isotomurus palustris* Mull.
*Orchesella cincta* L.
,, var. *vaga* L.
*Lepidocyrtus lanuginosa* Gmel.
*Entomobrya albocincta* Templ.
*E. nivalis* L.

## MAPS FOR RECORDING THE DISTRIBUTION OF ANIMALS, PLANTS, ETC., IN BRITAIN.

We have received from Professors A. E. Boycott, F.R.S. and E. J. Salisbury, F.R.S., two convenient octavo maps showing the Watsonian counties and vice-counties, with an index relating the numbers which are generally used to the names of the divisions. One version is printed wholly in black and is intended for record : occurrences may be conveniently put in with red ink, so that the numbers may be read through the ink. In the other version the outline only is in black, the county divisions, numbers and index being in blue, which will disappear when photographed. This is meant for reproduction and reduction ; occurrences are marked in black and the map may then be reproduced with only the essentials showing. The maps may be obtained from Messrs. Oliver and Boyd, Tweeddale Court, Edinburgh, at a reasonable price.

## THE CLOUDED YELLOW.

C. W. WRIGHT.

On Sunday, 3rd September, I saw two examples of the Clouded Yellow on Ferriby foreshore. They were flying fast, and only alighted very occasionally on the Sea Aster. Since the foreshore is the same for about four miles there were probably many more examples about.

## GIFT TO LEEDS UNIVERSITY.

The herbarium of the University of Leeds has recently received a collection of Stoneworts (Charophyta) the gift of the Rev. G. R. Bullock-Webster, M.A., F.L.S., F.R.M.S., Hon. Canon of Ely Cathedral, who has for many years specialised in this most interesting group of submerged aquatic plants, and who, in collaboration with the late James Groves, wrote a monograph of the family, which was printed by the Ray Society in 1920-24. The collection includes 42 sheets issued as Fascicles I and II, 1924, and 200 additional sheets collected in Great Britain, Ireland, France and Switzerland with a number of authors' proof plates of illustrations.

The gift is highly appreciated in the Botanical Department of the University both for its technical excellence and as a work of reference in the study of a critical group of which the donor and his friend Groves have been leading exponents.

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## REVIEWS AND BOOK NOTICES.

**A Country Holiday**, by **Arthur Davenport.** 320 pp., 4 illustrations in colour, and 12 in black and white. Hodder and Stoughton, 8/6. A town boy of sixteen spends a long and delightful summer holiday with a squire's son, who knows his countryside very well indeed. The record of this holiday's main events are set forth in dialogue form and the whole is very well done. A surprising amount of natural history and animal lore is worked into realistic conversations and the illustrations are good and help out the text admirably.

**Fishes : Their Journeys and Migrations**, by **Louis Roule.** Translated from the French by Conrad Elphinstone. x+270 pp.+ 54 figures in the text. Routledge, 12/6. This is a most readable, informative, and reliable account of the migrations of such fish as the salmon, herring and eel. The author is Professor at the National Museum of Natural History in Paris, and has spent many years in the investigation of the mysterious journeyings of fishes. The results of his researches are well set forth in this volume. The translation appears to be a very sound piece of work.

**British Beetles : Their Homes and Habits**, by **Norman H. Joy, M.R.C.S., L.R.C.P., F.R.E.S., M.B.O.U.** xii+144 pp. Warne, 5/-. This is an ideal introductory memoir and is just the book to put into the hands of the naturalist who wishes to commence the study of Coleoptera. Clearly written chapters deal with the finding and capture of beetles, their treatment after capture, the life history of a beetle and the naming of beetles. Then follows brief but adequate descriptions of the more important species. About 250 very clear outline drawings and 17 photographic illustrations form a most efficient accompaniment to the text. Those who begin the study of Coleoptera with this book will find it to be an admirable introduction to Dr. Joy's more ambitious work entitled, ' A Practical Handbook of British Beetles.'

**Elements of Botany**, by **R. M. Holman and W. W. Robbins**, pp. 404, figs. 267, price 16/6 (Chapman and Hall). Of the making of text books there is no end and on account of their general similarity most of these productions quickly sink into obscurity. This should not, however, be the fate of the book written by Professors Holman and Robbins. It must be easily one of the best text books which has appeared for some years. While it surveys the whole field of botany, the treatment of structure in relation to function is particularly well done and the examples

given of different types of plants are very well chosen. The British reader may notice the absence of any strictly ecological chapter, but the chapters on physiology and heredity are quite adequate and well conceived. A most noteworthy feature of the book is the quality of the text figures. These are remarkably comprehensive and particularly clear and the book may be highly recommended for the utility of these alone. The form is excellent and the cover is waterproof and vermin-proof—another notable feature in an ably-planned production.

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## NEWS FROM THE MAGAZINES.

*The Transactions of the Lancashire and Cheshire Antiquarian Society*, Volume XLVI, contain an excellent portrait of the late Sir William Boyd Dawkins.

*The Yorkshire Architectural and York Archæological Society* has issued the first part of its Proceedings, which are largely occupied by an illustrated description of the Roman Bath recently discovered at the Mail Coach Inn, St. Sampton's Square, York, by Philip Corder.

Bulletin No. 62 of the Ministry of Agriculture and Fisheries (H.M. Stationery Office, 1/6, postage extra), is an account of the details and problems of commercial bulb production, which will prove useful to anyone interested in the varieties and methods of growing this type of plant.

We see from *The West Australian* for July 12th, that Mr. L. Glauert has been elected President of the Royal Society of Western Australia. Our older readers will remember Mr. Glauert as a keen amateur geologist at Sheffield. He left England to join the Geological Survey of West Australia.

A well-illustrated account of the Saxon cemetery at Guildown by A. W. G. Lowther appears in *The Surrey Archæological Collections*, Volume XXXIX. It gives an account of the excavations of over 200 graves, which is particularly interesting to our readers, as many of the relics excavated are very similar to those found in the north.

Bones of *Bos longifrons*, small Celtic sheep, pig, fowl, and red deer are recorded on the Roman Site at Heronbridge, in *The Journal of the Chester and North Wales Architectural, Archæological and Historic Society*, recently issued. This publication is entirely occupied by illustrations and descriptions of the Roman remains found there.

In *Archæologia Aeliana*, Volume VIII, Dr. A. Raistrick has a paper on Bronze Age Settlements of the North of England, with many maps. The same author writes on Excavation of a Cave at Bishop Middleham, Durham, in Volume X of the same publication, and there are interesting notes on Early Bronze Swords, and cup-marked rocks in the same journal.

In the *Journal of the Linnean Society* (Botany), No. 329, Dr. D. H. Scott and Professor H. S. Holden describe the vegetative organs of *Scolecopteris oliveri*. Professor M. O. P. Iyengar describes the colonial volvocales of South India ; giving diagnoses of a number of new species and varieties. Miss E. D. Brain gives the results of a study of geotropism in three species of *Lupinus*.

From Mr. Hans Schlesch, whose important conchological collections are in the Museum at Hull, we have received two papers, namely, Nachruf an Professor Dr. Baron Géza Gyula Fejérváry de Komlòs-Keresztes, and Kleine Mitteilungen IX. The latter contains illustrations of an enormous number of deformities and monstrosities in land and freshwater mollusca, a subject in which Mr. Schlesch has specialized.

*The Entomologists' Record* for July/August contains ' The Larval Period of *Aegeria apiformis*,' by E. A. Cockayne ; ' Noctuæ in 1932,' by A. J. Wightman ; ' Donegal in August,' by Rev. Canon G. Foster ; ' Lepidoptera at Maurin,' by A. E. Burras, W. P. Curtis and W.

Fassnidge ; ' Zygæna, Grypocera and Rhopalocera of the Cottian Alps,' by R. Verity ; ' British Noctuæ,' by H. J. Turner ; and ' Lepidopterology of the Argentine,' by K. J. Hayward.

In the *Palæontographical Society's Memoir,* Volume LXXXV, recently issued, are two monographs of particular interest to the northern geologists. The first deals with British Corallian Lamellibranchia in which Dr. W. J. Arkell illustrates and describes many bivalves from the Yorkshire Oolites, several of which are in Yorkshire Museums ; and Professor S. H. Reynolds describes Red, Roe and Rein-deer of Britain. Here again many northern examples are referred to. The third section is devoted to The Gault Ammonites, by Dr. L. F. Spath.

*The Transactions of the Northern Naturalists' Union,* 1932, part 2, Vol. I, contains a further study of pollen distribution in peat by Drs. A. Raistrick and K. Blackburn, entitled ' The Late-Glacial and Post-Glacial Periods in the North Pennines.' The Rev. J. E. Hull has an article on the nomenclature of British Linyphiid Spiders, and Professor J. W. Heslop-Harrison gives details of the autumnal moths of the genus *Ophorinia* with an account of a new American species. Dr. M. Richardson produces evidence in confirmation of the occurrence of *Gymnadenia odoratissima* in Britain.

The *Journal of Conchology* for June, 1933, contains articles on ' The Mollusca of Chislet Marshes,' by J. E. Cooper, ' The Alleged Occurrence of *V. moulinsiana* (Duprey) in Cumberland,' by D. K. Kevan, ' *Isidorella pyramidata* Sow.,' by Dr. H. E. Quick, and ' *Ancylus fluviatilis* Bred in a Bell Jar,' by C. Oldham. J. Davy Dean contributes an article on ' The Type of *Geomelania,* with Descriptions of a New Species,' and R. Winckworth deals with the names of British Marine Mollusca. There are notes on the ' Colouration of *N. lapillus,*' by E. St. J. Burton, and on ' The Mollusca of Sussex,' by J. G. Dalgliesh.

*The Entomologist* for August contains ' Two New Subspecies of *Parnassius acdestis,*' by C. Eisner (with plate of subsp. *felix*) ; ' A Collecting Trip in Scotland, the North of England and Wales, April, 1933,' by C. G. M. de Worms (Aviemore, Struan, Witherslack and Conway) ; ' Insects and other Arthropods Collected by Major R. A. Bagnold's Expedition to the Libyan Desert,' by W. B. K. Shaw ; ' Bombyliidæ in the New Zealand Fauna,' by S. I. Paramonov ; ' The Corfiote Subspecies of *Maniola jurtina,*' by P. P. Graves ; ' Notes on Braconidæ : XIV. Alysiides,' by C. Morley ; and numerous notes and observations, including migration records.

The *Entomologist's Monthly Magazine* for August contains an interesting article on the biology of the common household beetle *Niptus hololeucus* Fald. by Mrs. M. Miles. The larva resembles that of a lamellicorn beetle in appearance and is found lying in a curved position in its pabulum which consists of various substances such as linseed cake and any edible substance. It has even been reported as consuming cayenne and cantharides. The perfect insect resembles a small yellow spider. There are probably two broods in the year. Dr. M. Cameron continues his article on Japanese Staphylinidæ, and Mr. W. D. Hincks has notes on the Passalidæ. Mr. V. H. Chambers writes on the Aculeate Hymenoptera of Bedfordshire and gives records for several rare species including the Tiger Beetle parasite *Methoca ichneumonides.* Miss D. Aubertin and Mr. C. Diver record the interesting Syrphid *Triglyphus primus* Lw. as new to Britain, from Kensington. This is a small species closely allied to the genus *Pipizella* but distinguished by its curious abdomen in which only three segments are visible. It appears to be a rare species on the Continent. There are several short notes including one on the beetle *Agelastica alni* from Essex. This beetle has been considered as doubtfully British, most of the specimens extant being unlocalised. These from Essex were taken in the late 'sixties, near Rainham and Purfleet.

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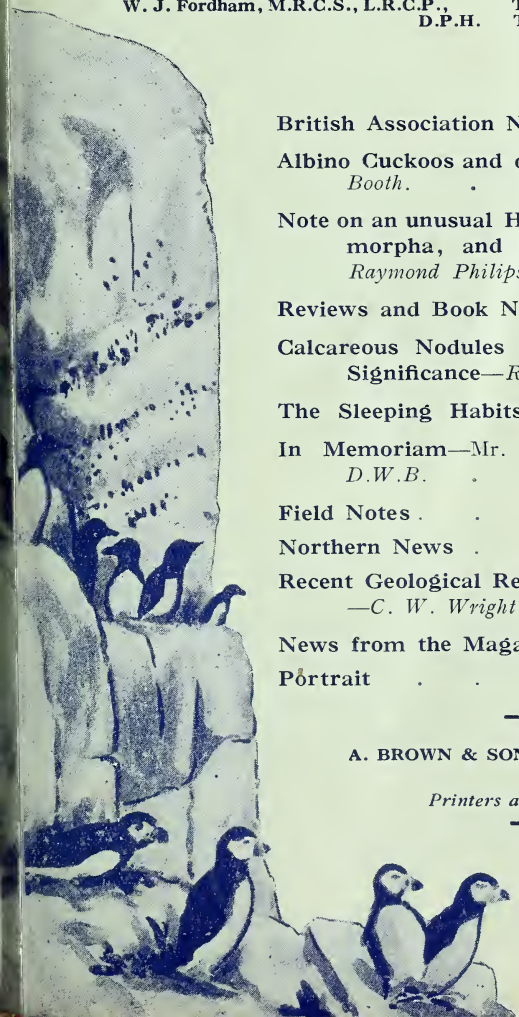

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## BRITISH ASSOCIATION NOTES AND COMMENTS.

The meeting of the British Association at Leicester was a great success and reminded one of the old days at the Association's meetings. Those who were at the previous meeting at Leicester twenty-seven years ago will remember the great efforts then made to meet the requirements of the visitors. This year things were even better. In the interim new thoroughfares have been cut through tenement property, and several magnificent buildings have been erected, which admirably housed the increased demands of the sections and committees of the Association.

Everybody, from the Lord Mayor and the Bishop, down to the boy scouts and messengers, seemed to have been 'enthused.'

An indication of the local interest was shown, as there were 700 local members for the meeting. The larger buildings were illuminated, and badges were provided, and the visitors had the privilege of free rides on the Corporation cars—a welcome revival of two innovations at the Hull meeting.

The ' old school ' seemed to be quickly disappearing—and the once familiar faces had mostly gone—and younger and unfamiliar Rolands this year were waiting for their Oliver.

This year again many of the meetings were marred by the inaudibility of the speakers. Also, among the younger readers of papers there was much inclination to teach their elders how to extract the contents of eggs by means of suction. So much so that the time has come when papers submitted should be edited by the officers of sections.

Popular lectures were given by Sir Josiah Stamp on ' Must Science ruin Economic Progress ' ; by Prof. J. F. Thorpe on ' The Work of the Safety in Mines Research Board ' ; ' Transport for a Century ' by Sir Henry Fowler ; and ' Ants and Men,' by Prof. Julian Huxley. There was also a symposium on the ' Cultural Value of Science in Adult Education,

At the Conference of Delegates for corresponding societies the President, Dr. R. E. Mortimer Wheeler, gave an address on ' The Centralisation and Control by Research in its relation to learned Societies ' ; and the Chairman, Mr. T. Sheppard, opened a discussion on ' The effects of pollution on the fauna and flora of ruins and the responsibility of local societies therein.' This address was ordered to be presented *in extenso*. Mr. G. C. Robson spoke on ' Zoological Surveys ' ; Mr. J. Fairgrieve on ' The Amateur Meteorologist ' ; and Capt. Dannreuther spoke on the necessity for recording invasions of insects and their appearance at stations on the coast and at sea.

The publications available for the members consisted of

the Journal, containing abstracts of the various communications (128 pages); and the Programme and Daily Time Table (44 pages). To the latter a daily supplement appeared, recording changes in the programme. One of these contained the unexpected item: Prof. Tolman on 'The Learning of Rats. Prof. Katz withdraws.' There was also a list of the members attending.

Towards the close of the meeting it was possible to purchase *The Advancement of Science*, which contained the President's and the Secretarial addresses, as under:—

'Some Chemical Aspects of Life,' by Sir Frederick Gowland Hopkins; 'Seasonal Weather and its Prediction,' by Sir Gilbert Walker; 'Natural Colouring Matters and their Analogues,' by Prof. R. Robinson; 'A Correlation of Structures in the Coalfields of the Midland Province,' by Prof. W. G. Fearnsides; 'The Mechanical View of Life,' by Dr. J. Gray; 'Geography as Mental Equipment,' by The Rt. Hon. Lord Meston; 'The Gold Standard,' by Prof. J. H. Jones; 'Some Experiences in Mechanical Engineering,' by Mr. R. W. Allen; 'What is Tradition?' by the Rt. Hon. Lord Raglan; 'The Activity of Nerve Cells,' by Prof. E. D. Adrian; 'The Status of Psychology as an Empirical Science,' by Prof. F. Aveling; 'The Types of Entrance Mechanisms of the Traps of Utricularia,' by Prof. F. E. Lloyd; 'The Development of the National System of Education,' by Mr. J. L. Holland; and 'Chemistry and Agriculture,' by Dr. A. Lauder.

At the close of the meeting sums amounting to £770 were voted for scientific research, and it was arranged that future meetings of the Association should be held at Aberdeen, September 5th to 12th, 1934; Norwich in 1935; Blackpool in 1936; and Nottingham in 1937. The unusual course was adopted of allowing the various deputations to remain in the room while the invitations were received, thus stifling discussion. On the proposition of the delegate from the Yorkshire Naturalists' Union, it was unanimously agreed that in future the old rule of requesting a deputation to withdraw while the matter was being considered, should be resumed.

In Section A (Mathematics) Dr. Balbage's address on Cremona transformations began with 'If Vk is a rational K—dimensional locus'—so they are not always what they seem. In Section B (Chemistry) Dr. D. J. Lloyd referred to 'The Chemistry of Skin and the problem of the tanner.' In Section C (Geology) the papers, naturally, largely referred to Leicestershire. Those of interest to northern readers were a discussion on 'The shore limes of the Midland Barrier during Carboniferous times'; Dr. A. Raistrick referred to 'The Microspores of Coal and their use in correlation; Prof.

G. Hickling and Mr. C. E. Marshall gave the result of ' Recent studies of plant structure in coal.' In Section D (Zoology) Mr. A. Roebuck referred to ' The Rook in the Rural economy of the Midlands,' and Mr. M. A. C. Hinton to ' The Musk-rat and its problem ' ; Mr. P. S. Milne ' The distribution of Insects by currents at various levels in the atmosphere ' ; Mr. M. Graham on ' Prediction of North Sea cod fisheries,' and Mr. E. Ford on ' Growth in length and change in form with increasing ages in fishes, especially the herring.' In Section E (Geography) Dr. H. C. Darby read on ' The geographical conceptions of a medieval bishop,' and Prof. E. G. R. Taylor on ' Economic geography of early Stuart England.' In G (Engineering) Mr. H. F. Atter contributed ' Legal aspects of river pollution,' and Mr. M. Du-Plat-Taylor on ' Sea defences and reclamation of land from the sea.' In this we learn that ' the loss by coastal erosion and the gain of land by accretion around the coasts of Great Britain about balance, but the land lost is generally good agricultural land, and even parts of towns or villages, and the gain is only sand or shingle.' In Section H (Anthropology) Mr. H. W. Elgee gave an extraordinary address on ' The Mother Earth Cult in N.E. Yorkshire.' In Section K (Botany) Miss L. I. Scott and Prof. J. H. Priestley read a paper on ' The Monocotyledon and shoot from the standpoint of development ' ; Dr. D. M. Wilson on ' The life-history of some British Fern Pl nts.

Supplementing these addresses were several excursions to factories, engineering and chemical works, geological and botanical areas, etc.

T. S.

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### THE MIDLAND COALFIELD.

In his address to the Geological Section, Prof. W. G. Fearnsides sketched the Midland coalfield province, lying within a circle of 60 miles round Buxton, bounded on the north by the rigid block of Craven, on the west by the compacted ridges of Denbighshire and the Berwyns, on the south by the ragged ribs of ancient rock fringing the Midland barrier of St. George's Land, and on the east buried beneath thick Permian, Trias, and Jurassic Rocks, where no man has seen or touched the rocks below the Carboniferous. He said that within this province are nearly 1,000 working mines, 500 of them each employing more than a hundred men in the winning and working of above 120 million tons of coal per year, or more than half the total mineral wrought underground in Britain.

### SCIENTIFIC JARGON.

In his address referred to elsewhere, Dr. R. E. M. Wheeler

stated :—I have just been turning over the pages of an excellent journal which makes it its business to present the results of scientific archæology to the general public, and my eye has caught three articles by three of the most distinguished archæologists of the day. On one page I am caught up in the astonishing hyphenated word ' leaf-shaped-sword-culture-complex ' ; on another, I see the dark phrase ' the diagnostic value of negative lynchets ' ; on a third, the remarkable sentence, ' These names were left by the equestrian inhumators who brought in the later Hallstatt culture.' One may perhaps suppose that the ' equestrian inhumators ' had their counterpart in such folk as ' pedestrian incinerators,' and were the forbears of such distinguished sects as the ' aerial seventh-day Adventists ' and the ' submarine Rosicrucians.' In any case we may best describe this obscurantist jargon by the one simple word, Hokum. And, whatever may be the case in other branches of science, it is sufficiently certain that in professional archæology at the present day, Hokum is on the increase. Learned and estimable young men in baggy trousers and suede shoes are spreading contagiously from our universities and are beginning to cloud their science and their own minds with a whole lot of unnecessary Hokum, fortifying themselves the while with the disastrous slogan, *Odi profanum vulgus et arceo.*

ARCHÆOLOGICAL RESEARCH.

Dr. Wheeler continues :—The remedy, could it be enforced, is an easy one. Could these young men—and, indeed, some of their elders—but be compelled to explain their ideas periodically to, shall we say, the Netherwallop Antiquarian Society and Field Club in language intelligible to the local birdscarer, then could we begin to hope at length for clarity of expression and clarity of thought. But what in fact happens in all too many cases is this. A young man of ability goes up to one or other of the older universities and there comes under the influence of a highly-specialised teacher, who instils his own special tastes and ideas into his disciple and ultimately secures a fellowship for him. The youth remains at the university for the rest of his mortal existence, coming only intermittently and accidentally into contact with the *profanum vulgus* beyond its walls. I am speaking now in particular of my own science of archæology, where the number of professional openings outside the universities is restricted to an extent perhaps unparalleled in any other branch of science. In the discussion the Chairman, Mr. Sheppard, stated that he was particularly glad to hear the president's remarks, as for more years than he cared to remember, he had, in the

pages of *The Naturalist*, protested against this new nomenclature.

ROOKS.

In the Zoological Section Mr. A. Roebuck stated that rooks have been studied in five midland counties—Leicestershire, Derbyshire, Nottinghamshire, Lincolnshire, and Rutland. A census of the whole area, repeated after an interval of four years, showed the rook population to be constant. About 10 per cent. of the rookeries change their sites annually. There is no evidence that migration materially affects the problem in the Midlands. The distribution of their roosts during the winter is considerably different from that of their nesting rookeries, although many remain on the same sites all the year round. Except for a brief period rooks are restricted to a limited area for a feeding-ground, the area in the vicinity of the rookery. Those roosting at a distance in winter return daily. The census gives the rook population when it is at its lowest.

NORTH SEA FISH.

Mr. M. Graham pointed out :—It is known that fluctuations in the yield of certain fisheries, *e.g.* herring, plaice and cod, in the North Sea are largely determined by the degree of success in survival of broods some years previously. The proportion of particular broods is estimated when the fish are large enough to be taken in trawls. Having found that the important fisheries depend on fish of a restricted age, say, five to six years old, estimates of the yield at that age can be made some years in advance, from the abundance of fish of, say, one to two years old. The particular case considered, the cod in the North Sea, is interesting in that: (1) the area populated by small fish is so extensive that adequate sampling of small cod can only be obtained in the trade statistics of landings, cause being shown for considering the magnitude of certain seasonal changes in the statistics as a measure of brood strength ; (2) the age of the cod (by which landings of small cod are related to brood years and to subsequent yield of large cod) has to be obtained indirectly, from size ; partly because of the said sampling difficulty and partly because the more usual determinations of age from scales or otoliths are unreliable for this fish (in the North Sea). The necessary analysis involves somewhat unconventional methods, which are, however, justified by the high correlation found.

TANNING.

Dr. D. J. Lloyd told us that animal skin consists of a tissue of fibres which are the biological units. Each fibre

has crystalline properties and is formed of packets of elongated molecules between which are planes of weakness. The fibre can be split up at these planes into fibrils. This is an essential pre-tanning process since it increases the capillary space through which the colloidal tannins can diffuse and makes the polar groups of the protein accessible to the tan. Collagen carries positively and negatively charged polar groups, and collagen fibres contain both bound and free water. Tanning consists in conferring chemical and physical stability on the collagen fibre by the suppression of the active groups and the elimination of water.

### PLANT STRUCTURE IN COAL.

Prof. G. Hickling and Mr. C. E. Marshall told us that improvements in the technique of section-cutting and photography have made it possible to show that coal consists largely of plant-remains in which the details of the original structure are preserved with remarkable perfection. This detail, in some respects, far exceeds that which can be observed in the familiar calcified or silicified petrifactions or coal-balls, since in the coal most of the original substance of the plant remains, while in the petrifaction it has been replaced. By the study of isolated sheets of bark and portions of wood which are preserved as coal in the coal-measure shales the micro-structure of the plants can be studied in relation to their external form. The bark-structures of *Lepidodendron*, *Bothrodendron* and *Sigillaria* have been so studied, as well as certain woods. In certain cases it appears possible to demonstrate conclusively that the existing coal consists in part of the original plant-substance and in part of additional organic material which has been absorbed by the plant after death.

### STUART GEOGRAPHY.

Prof. E. G. R. Taylor stated :—The economic problems of England three centuries ago, as they are discussed in the literature of the period, are strikingly similar to those discussed in newspapers to-day. Over-population, the decay of rural life, urbanisation, unemployment, the burden imposed by high wages and rising prices on the upkeep of great estates, the ruin of the roads by heavy traffic for which they were not designed, the dangerous depletion of timber supplies, ' unfair ' foreign competition in the fishing industry, free trade and the balance of trade, the need for improvement of internal waterways, for the control of flood-waters, for the reclamation of fens and marshes, for the improvement of methods of husbandry—all these had their geographical aspects.

SEA DEFENCE.

Mr. M. Du-Plat-Taylor, speaking of coast erosion, said :— The loss can be prevented by coast defence works, such as sea embankments or sea walls, the drainage of clay cliffs, and groyning. Although reclamation of land from the sea for industrial purposes may be an economic process it is not so for agricultural purposes unless it is carried out in combination with dredging or the disposal of waste materials. Material deposited on reclamation areas may be material dredged from adjoining navigation channels, which can be pumped ashore by suitable plant. This is often cheaper than sending it out to sea to be dumped in deep water. House refuse may also be used for raising the level of such low-lying lands if economical means can be found for so depositing it. In London alone, the quantity of house refuse to be disposed of annually is 1½ million tons, and in addition, 3 million tons of sludge from sewage disposal is sent out to be dumped at sea. The Author suggests that means of disposing of all this upon marsh or mud land should be investigated. As regards coast defence works, various forms of protection will be discussed and approximate costs given ; and finally, various schemes for enclosure and reclamation which have already been put forward will be examined from the point of view of probable ultimate profit and the relief of unemployment.

RIVER HULL POLLUTION.

Mr. Sheppard, who is also chairman of the River Hull Pollution Committee, had been asked to address the delegates on this question. He pointed out that in its lower reaches the River Hull is tidal and very brackish. 'When it is remembered,' he said, 'that the Humber is fed by the Trent and Ouse, and their tributaries, which carry the sewage from a large proportion of the towns of the north of England, it will be understood that this area is not of much interest to anglers.' The area reviewed by him, therefore, was a matter of 16 miles between the top lock at Beverley, where the tidal influence ceases, and Driffield, about which the trout streams are pure and well stocked with fish.

EPIDEMIC RECALLED.

The growing population at Driffield and Beverley (with its increase in factories), sewage disposal works, the more modern methods of agricultural drainage (with the contamination caused by the increase of artificial and other manures on the land), as well as the effect of tar sprays and petrol washed from the roads, all had helped to change the nature of the fauna and flora of the river. 'Many years ago,' said Mr.

Sheppard, ' Hull's supply was extracted from the water of the River Hull and passed through filter beds at Stoneferry. A serious epidemic at Beverley was followed by a much more serious outbreak at Hull, for, while the filter beds clarified the turgid waters, they were unable to extract the bacteria. Since then Hull has bored into the chalk for its water supply.' The anglers first drew attention to the fact that sections of the stream, which once were prolific, were almost useless for angling purposes. It was recorded that a man ' who gave his age as 76 years, stated that the most interesting day of the week on which to view the canal at Whinhill is Tuesday, as on that day " blood and suds " come down the stream ; blood from the slaughterhouses at Driffield, Tuesday being killing day ; and " suds " from the washing of clothes which takes place on the same day of the week.'

### APPEAL TO FISHERY BOARD.

The members of the various angling societies in the district, realising that the changes in the river were resulting in the fish gradually disappearing, appealed to the Yorkshire Fishery Board, which in turn appealed to the Ministry of Agriculture and Fisheries. That Board sent its scientific representative, Dr. E. C. Jee, to make inquiry, and eventually a local committee was formed to investigate. Periodical examination was made of the state of the miscroscopic fauna and flora of the river, as upon these the fresh water snails, worms, etc., fed, which in turn supplied food for the fish. Samples have been periodically taken at various points in the stream. The effect of sewage, gasworks affluents, and other sources of contamination were apparent and having obtained sufficient scientific evidence to show that these sources of pollution had a detrimental effect upon the health of the river fauna, and were therefore likely to be detrimental to the health of human beings, interviews were arranged with the various parties concerned. As a result, improvements have been made in the method of treating the sewage, and in preventing poisonous gas liquor from finding its way into the river.

### CAGED FISH.

Experiments were made to ascertain the effect of the polluted water upon the fish in different parts of the river. Large numbers of different species were secured, placed in specially designed cages at selected points of the river, and periodically examined. So far, however, the experiments have largely been of negative value. ' As years go on,' declared the speaker, ' increasing population on the banks of the river, and on its tributary streams, together with the

necessity for disposing of the waste liquors from the factories which increase in size and numbers, all mitigate against a return to the "good old times." But the Ministry of Agriculture and Fisheries considers that the work done in East Yorkshire by amateur zoologists, botanists, and chemists, might easily be undertaken in other areas.' The British Association paid Mr. Sheppard the compliment of announcing that they had decided to print his report in full.

## FIELD NOTES.

**Theba cartusiana Mull., etc.**—I have recently obtained specimens of *Theba cartusiana* Mull. and *Helicella itala* L. at Charlottenlund Fort near Copenhagen. In *The Naturalist*, 1916, page 61, I gave a notice of the occurrence of *Theba cartusiana* Mull. and *Helicella* '*candicans* Zgl.' at 'the fortress near Jægersborg near Copenhagen' (=Charlottenlund Fort). Unfortunately it was during the war, and I was not allowed, personally, to visit the place. My records were doubted (see Taylor's *Monograph*, Part 23, 1917, page 111 (under *Theba cartusiana*). As Charlottenlund Fort was recently opened for the public, I examined the ramparts there, and found both species in great numbers, and also a sinistral specimen of *Helicella itala* L. Most of the *Helicella itala*, however, are very planulated, therefore I have named it '*candicans*'=*obvia* Hartm. 17 years ago.—HANS SCHLESCH, Copenhagen, Denmark.

**Ringed Carrion Crow.**—On July 24th Mr. Usher, head gamekeeper to Capt. B. H. Croft, of Malham Tarn, shot a young Carrion Crow on Fountains Fell, with a ring on its leg, and he was very much puzzled to know how the ring got there, so he sent the ring on to me. It was one of Witherby's and was numbered RT6701, and Mr. H. F. Witherby has kindly informed me that it was ringed as a nestling at Giggleswick on May 14th, 1933, so that it had not got very far on its travels.—H. B. BOOTH.

**Mimicry**, by **G. D. Hale Carpenter** and **E. B. Ford**. Published in Methuen's Monographs on Biological Subjects, ix+134 pp., 3/6. This is a valuable addition to the library of the entomological student. The authors are themselves convinced of the reality of mimicry, and in the short space at their disposal make out a fairly reasoned case. The references are numerous and are gathered from a very wide field.

**Collision Processes in Gases**, by **F. L. Arnot**. Published in Methuen's Monographs on Physical Subjects, viii+104 pp., with 37 diagrams, 3/-. This is a short account of recent work on 'collision processes in gases at pressures such that the mean free paths of the colliding bodies are so large relative to the dimensions of the apparatus that the effects can be studied.' It should prove useful to the advanced student of this branch of physics, saving him an immense amount of labour in looking up the literature.

## ALBINO CUCKOOS AND OTHER CUCKOO NOTES.

H. B. BOOTH.

THERE is evidently a strain of albinism in one or more of the Cuckoos that annually visit the Embsay and Eastby Moors, although no adult Cuckoo has been seen with any extra white on it. In all, in four years, there have been four young albino Cuckoos—no mean record for any district. The first I reported in my annual West Riding Ornithological Report for 1929 (*Nat.*, 1930, p. 79). This bird is preserved and is in the Craven Museum at Skipton. It is a most beautiful bird, being immaculately white. It is worth any bird lover's while to see it if in that town, though, unfortunately, excepting by arrangement, this museum is only open to the public from 2-30 p.m. to 4-30 p.m.

The following year another white young Cuckoo appeared on these moors, which are really a fringe of Barden Moor that hangs over into Airedale. I was informed that the Duke of Devonshire (who had seen the bird in the Craven Museum) gave instructions that this bird had not to be shot, and it apparently left the district in good health but did not return.

On July 20th of this year I received a letter from Mr. F. J. N. Dufty, of Skipton, informing me that there were two young white Cuckoos on the same moors, and that if I would go up to Grouse Cottage there, the gamekeeper (Mr. Stewart) would be able to show them to me. On the following Sunday (July 23rd) I made my way up, but, unfortunately, was too late. Mr. Stewart had caught one of these birds asleep on the bracken in the evening, and had taken it home, where it was not caged, but had the full run of his kitchen for nine days. It became very tame, and would sit on their fingers and take caterpillars from their hands. It kept the gamekeeper's young children busy almost all the day in hunting for caterpillars to feed it. Mr. Stewart told me that it was pure white with pink eyes, and he thought that it had defective sight because it often missed the caterpillar on a plate or between the fingers with the first peck. Four days before I arrived some one had left the kitchen door open and the Cuckoo disappeared and was not seen again. After having been pampered and fed it would probably die a natural death from starvation, but let us hope not.

Nor were we able to find the other white youngster some few hundred yards away. Mr. Stewart said it was a larger and more robust—and probably an older—bird than the one he had caught.

There were quite a number of people from Embsay and

Skipton up at Grouse Cottage who had seen the white Cuckoo the Sunday before, and who had brought their friends to see it. It will be of interest to note if these albino birds will be observed or shot whilst on migration or in their winter quarters, or if they will return to their native heaths.

The female Cuckoo usually very carefully lays her egg so that it will synchronise with the hatching of the egg of the foster parents. But occasionally, just before the eve of her departure, she will do some extraordinary things. I have known a Cuckoo towards the end of June lay two eggs in an old disused and empty nest of a Pied Wagtail ! ! A friend (Mr. A. E. Pullan, of Burley-in-Wharfedale) sent me word that a gamekeeper had shown him and some friends the nest of a Meadow Pipit on Sunday, June 25th, which contained a newly hatched Cuckoo, and in which the young Pipits were about a week old and pen-feathered. The young Cuckoo was working ceaselessly and heroically to eject its large foster children, but without much success. I immediately wrote Mr. Pullan to have this nest watched as much as possible, as it was a most interesting case as to whether the Cuckoo, or the Pipits, or both, would survive. He replied that he was doing so, and that one of his friends who had stayed on the moor until late on the Sunday evening was of the opinion that the Cuckoo would live. The following day all were alive in the nest, but the Cuckoo was not nearly so active. On the next day (Tuesday) the young Cuckoo was dead and had been thrown out of the nest by its foster parents. It had paid the penalty for its mother's mistake, which Nature rarely forgets or forgives.

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## NOTE ON AN UNUSUAL HABITAT OF MARCHANTIA POLYMORPHA, AND ITS SEASONAL ASPECTS.

W. RAYMOND PHILIPSON, B.A.

In June, 1932, it was noticed that a considerable area of the reed bed at the west end of Gosforth Lake, Northumberland, was thickly carpeted with Marchantia. Since then the spot has been visited at intervals and search has been made for Marchantia in other parts of the reeds, without success. As the reeds had been cut over just the area that the liverwort spread, it is suggested that this is a factor essential for its success. Upon enquiry it was found that this area had been cut regularly for ten years, and nowhere else had the reeds been cut, except for a small patch at the other end of the lake, which had been cut for three years. In the autumn the

thalli became black and shrivelled, but they evidently perennate by means of growing-points which remain dormant, but living, for in March green lobes grow from the dead remains of last year. In April these thalli are richly covered with gemmæ-cups, but the asexual stage does not last long. In June very numerous sexual branches are produced which, in the two seasons during which they have been observed, have been exclusively female. That male plants are quite absent is probable, as no capsules are formed. Many of the female receptacles have withered by the end of July, but young ones are still being formed at the apex. The thallus begins tc blacken in August, and soon, except for the growing points, is quite dead. Gemmæ were produced by all the plants, but sexual branches only in those parts of the reed-bed where a closed marsh vegetation was able to grow. Where the peat was more damp Phragmites and Marchantia grew by themselves in an open community ; here the liverwort reproduced only by gemmæ in the spring.

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## REVIEWS AND BOOK NOTICES.

**Birds of the Ocean**, by **W. B. Alexander.** With 140 illustrations mostly reproductions of photographs, 1-428 pp., size $4\frac{1}{2}+7$ inches, published in 1928 by G. P. Putnam's Sons, New York and London, price $3.50 U.S. or fifteen shillings. This is a ' Handbook for Voyagers' and contains descriptions of all the sea birds of the world, with notes on their habits and guides to their identification. This book is invaluable to all those who ' Go down to the sea in ships ' and take pleasure in the birds seen at sea. With the aid of the photographs, descriptions and keys it is possible to name any sea bird observed. One feature of particular value is the series of plates in which the author has drawn, side by side, usually in flight, a series of birds of closely related species, *e.g.* on Plate 25 have been drawn twelve gulls and on Plate 37 ten terns ; these plates are a great aid to identification of a species. In the early summer of 1933, with the aid of this book, we were able to identify all the birds seen on a voyage from Hong Kong to England, with the exception of certain land birds seen from the Suez Canal. No scientific knowledge is necessary in order to be able to make full use of this book.

**Watchings**, by **W. R. Calvert.** Putnam, xvi.+304, 6/-. Those who read and enjoyed ' Just round the Corner ' will like this book. Those who do not know Mr. Calvert's writings will not be disappointed if they begin with ' Watchings.' Taking the months one by one, Mr. Calvert gives us scores of delightful essays on wild life, and he not only knows the art of telling and graphic description, but he is a keen and exact observer.

**The Way of a Bee**, by **George Rendl.** Translated from the German by Patrick Kirwan. Longmans Green & Co., vi+168 pp., 6/-. The author of this book, although a poet, has an intimate knowledge of the honey bee, and has compressed into a very short space a readable, straightforward account of the life in the beehive throughout the year. In spite of a marked avoidance of technical phraseology, the author gives much detail and is most accurate. The translator's style is pleasing and he has caught the author's mood.

# CALCAREOUS NODULES (' COAL BALLS ') AND THEIR SIGNIFICANCE.

R. CROOKALL, D.Sc., PH.D.

CALCAREOUS nodules (' Coal balls ') are of great importance, both in palæobotany and in the study of Palæozoic and other coals. From them deductions can be made relative to (1) the structure and affinities of the fossilised plants they contain ; (2) the climatic and ecological conditions under which the plants lived ; (3) the mode of accumulation of the vegetable debris which formed the seams of coal, *i.e.* whether the remains of the (clearly land) plants accumulated on the spot where they grew or whether they were drifted by water and collected under the water-cover of a lake, lagoon or estuary ; (4) the origin of part of the ash in coal ; and (5) the approximate original thickness of the plant debris which eventually formed the coal-seam.

DESCRIPTION.—' Coal balls ' are irregularly spherical or ovoid stones which occur either singly or in masses in association with some few seams of coal. They vary in size from that of a pea to several feet in diameter, but are most frequently of about the size of a potato.

Both in Britain and in Holland large masses of these nodules may locally occupy the whole thickness of the coal-seam and weigh upwards of two tons. The bedding planes of the enclosing coal arch over the ' coal balls ' (the latter offered greater resistance to pressure than did the coal). Mr. J. Lomax has described an exceptionally large mass. From the thickness of the ' coal balls ' compared with that of the adjacent coal, he concluded that 11 to 12 feet of vegetable debris had been transformed to form each foot of coal.

OCCURRENCE.—In Britain ' coal balls ' were first found in the Upper Foot Coal of Lancashire and the Halifax Hard Bed of Yorkshire, low down in the *Lower Coal Measures*.

They also occur in the Gannister Coal (beneath the Upper Foot) and at Stalybridge and Hough Hill in a small seam below the Gannister. At Laneshaw Bridge they are found in a seam in the *Millstone Grit*, while the Seven-feet seam of Wirral Colliery has also yielded them, *i.e. Middle Coal Measures*. Recently, a few ' coal balls ' have been discovered in the *Lower Carboniferous* of Haltwistle, Northumberland.

Abroad, ' coal balls ' are known from the *Carboniferous* rocks of Spain, Russia, Moravia, Westphalia, Holland, the United States of America, and New South Wales. Dr. Stopes has described nodules from the *Cretaceous* of Japan which showed resemblances to, but also differences from true ' coal ballls.'

' Coal balls ' are found in three situations relative to the coal seam. ' Floor ' nodules occur, somewhat rarely, in the fireclay floor of the seam. ' Seam ' nodules are found scattered irregularly throughout the coal itself ; they are

usually invested with a coaly layer so that, apart from their hardness, are not easily recognised. On washing with dilute hydrochloric acid or on being allowed to 'weather,' they become more conspicuous and are greyish-white or brownish-grey. Washed or 'weathered' nodules clearly show the direction of the bedding and often bear a median flange. 'Roof' nodules are found in the shaly roof of the seam.

The term 'coal ball' is used to include nodules from all three situations, as is also the word 'bullion.' 'Roof' nodules are sometimes distinguished as 'baum-pots,' 'posts,' or 'goniatite nodules.'

Chemical Composition.—The term 'coal ball' is unfortunate, as rounded pebbles consisting of coal—*i.e.* true coal balls—occur occasionally in the sandstones of the Coal Measures. The 'coal balls' of miners, on the other hand, consist mainly of the carbonates of lime and magnesia. They are *calcareous nodules*. Their composition is very variable. Adjacent nodules may contain very different proportions of the two carbonates, as well as of the remaining constituents. This, however, has little or no effect on the excellence of the preservation of the enclosed plant tissues.

In the case of 'seam' nodules, the remaining constituents, about 10 per cent., consist of the carbonates of manganese and iron, oxide of iron, pyrites, clay and carbon. Nodules occurring in the Bradford and Huddersfield districts are often so pyritous as to obscure the plant structures contained.

The amount of carbon contained in the nodules varies greatly, depending on the degree of coalification attained before the petrifaction of the tissues set in. Stopes and Watson have estimated that about one-third of the organic matter of the cells is preserved, usually forming brown ulmic matter, but being locally carbonised and black. Dutch and German nodules have been described as differing from English 'coal balls' in being pitch black. Many English nodules are, however, more or less black, and it is owing to the wealth of the material available in Britain that such nodules were discarded and have not usually come under the observation of Continental workers.

While 'seam' nodules contain only 0·2 per cent. of silicates and 92 per cent. of carbonates, 'floor' nodules contain 8 per cent. of silicates and 84 per cent. of carbonates, and 'roof' nodules 6 per cent. of silicates and 86 per cent. of carbonates. These amounts are of significance in view of the origin of the ash in coal, most of which was usually derived from non-vegetable sources. It is evident that the silicates occurring in 'floor' and 'roof' nodules represent sand.

Formation.—'*Floor' nodules* are clearly found in the place where they were formed and did not drift into position.

They contain petrified roots and rootlets. The common occurrence of such roots and rootlets in underclays supports the view that the latter represent old soils on which the Coal Measure forests grew.

*'Seam' nodules* were originally thought to have been transported by water, their rounded form suggesting that they has been rolled as pebbles. Closer inspection, however, reveals an irregular surface, quite different from that of water-worn pebbles. In some cases concentric bands, similar to those in ordinary mineral concretions, can be seen in 'floor' and 'seam' nodules. The rounded form of 'floor' and 'seam' nodules is thus explained by the fact that *they are concretions, formed around nuclei in the plant debris.* There is no record of (transported) erratic blocks in the Upper Foot Coal which contains many 'coal balls.' Again, at the Shore and Wirral Collieries and elsewhere, the whole thickness of the seam has been locally converted into calcareous nodules. Finally, in some instances, a stem or root which is petrified in a 'coal ball' can be traced into the surrounding coal (where it is coalified), while in other cases different parts of one and the same stem may be found petrified in neighbouring 'seam' nodules.

There is thus abundant evidence pointing to the conclusion that 'seam' nodules usually consist of members of plants which formed part of the seam itself, and that the debris usually accumulated *in situ.*

*'Roof' nodules* show distinct, though fine, bedding in the same direction as the bedding of the surrounding shales. The marine shells they contain (*Aviculopecten, goniatites,* etc.) often occur in bands along the bedding planes. These facts, and their occurrence in the shaly roof of the seam, show that they were formed from *drifted* material. The roofs of many seams (not containing 'coal balls') contain non-marine shells ('mussels') indicating that the plant debris was submerged by an incursion of fresh—or (more usually) brackish—water. The fact that the roofs of 'coal ball'–containing seams include marine animals indicates that it was an incursion of the sea which submerged these particular coal forests.

It was formerly thought that the petrifaction of plant tissues to form 'coal balls' was due to the infiltration of minerals from the marine roofs of the seams. By experiment Stopes and Watson showed, however, that delicate plant tissues may be preserved temporarily from decomposition by the sulphates in sea water. From this it was inferred that *the plants which formed 'coal ball'–containing seams grew on swamps with definitely brackish water round their roots* (under conditions similar to those of the present-day Mangrove swamps). They are so-called maritime coals, the preserving and petrifying minerals (sulphates of lime and magnesia)

being derived from the sea water. This view is supported by the xerophytic structure of the petrified leaves, by the presence of magnesium in the petrifactions and other features. It accounts for the rarity of seams containing 'coal balls' and for the fact that seams bearing 'coal balls' always have a roof containing marine shells.

Professor P. F. Kendall has pointed out that, 'It is probable that other coal seams have accumulated under similar conditions . . . without, however, giving rise to the formation of coal balls. Two such, though not in the Upper Carboniferous, may be mentioned. A small coal seam at Skateraw, near Dunbar, rests on a highly coralliferous limestone, into which Stigmarian rhizomes can be seen to ramify. The other example is seen in the well-known fragmentary coal seam at Meals Bank Quarry, Ingleton. The rootlets from this seam descend through the underclay of the coal and are traceable to a depth of several feet in the underlying compact limestone which, it is inferred, must have been in the condition of ooze when the plants were growing.'

Although the salinity of the sea was less during the Carboniferous Period than at present, the plants which went to form coal (chiefly Pteridophytes) could not live in definitely salt water. Where a coal has been laid down under truly maritime conditions, the vegetable debris must, therefore, have accumulated by drift.

Botanical Contents.—To determine their contents, 'coal balls' are sectioned at right angles to the bedding planes. 'Seam' nodules consist of petrified plant remains, while 'floor' and (some) 'roof' nodules contain petrified plants. The 'roof' nodules found in Holland contain no plant remains.

In the case of 'seam' nodules, the petrifactions clearly represent part of the plants which formed the adjacent coal. As has been observed above, occasional stems or roots may be seen which are continuous from the 'coal ball' into the surrounding coal. Had these organs not been preserved by impregnation with mineral matter in solution, they would have been coalified and formed a normal part of the seam.

When sectioned, 'floor' nodules are seen to be ramified by roots and rootlets, their only contents.

Of 'seam' nodules 80 to 90 per cent. consist of the club-moss rhizome known as *Stigmaria* (especially in Yorkshire) or of the Seed-fern stem known as *Lyginopteris* (especially in Lancashire).

'Roof' nodules usually mainly contain tissues which were resistant to decay (*i.e.* woody and corky tissues), the softer parts (which are generally well preserved in 'seam and 'floor' nodules) having decayed.

(*To be continued*).

# THE SLEEPING HABITS OF WHALES.

R. W. GRAY.

Whales are able to exist without breathing for many minutes and, perhaps, for hours at a time. But for this gift they would often be unable to satisfy their hunger and obtain the repose they from time to time require. Their lungs must be very powerful ; large whales sometimes project their breath high into the air, at the same time making a noise that may be heard a mile or more away.

In 1885, and again in 1889, I had the good fortune to see a Greenland whale asleep ; on both occasions the whales were seen among the drifting ice off the Greenland coast, and both of them were caught.[1]

A Greenland whale asleep presents a remarkable sight ; it is absolutely motionless and gives no signs of life. How long the animal is able to remain in this condition without awakening to breathe is a question I am unable to answer.

The attitude assumed by the sleeping whale probably depends on the position of its centre of gravity and that of its centre of buoyancy ; when the former is far forward the head must sink down ; when it is farther back the contrary will take place. In the two instances referred to, the back was awash and only the ' crown ' (on which the blow-holes are situated) exposed ; but according to my father, the late Captain David Gray, of Peterhead, they sometimes fall asleep with the head under water and only the hinder part of the body exposed.[2]

I now propose to ask and to answer, so far as is possible, certain question that arise in connection with the sleep of whales. Firstly, where do they usually sleep, at or below the surface ? In my opinion the answer is in accordance with the latter alternative, that is to say, they usually sleep under water below the level of the wave motion and, in Arctic and Antartic seas, of the drifting ice, where they are hidden from human observation and where they cannot be molested by birds. The following are my reasons :—

(1) Whales are seldom seen sleeping at the surface. The celebrated Scoresby, speaking of the Greenland whale, says, ' Whales are seldom found sleeping, yet instances occasionally occur in calm weather among the ice.'[3] My father, speaking of the feeding habits of the same species says, ' Sometimes, if the weather is fine and the sun warm, they will fall asleep on the surface of the water near where they have been feeding and will

[1] See my ' Sleep of Whales,' *Nature*, April 30th, 1927, and my ' Peterhead Sealers and Whalers ' now appearing in the *Scottish Naturalist*.

[2] *Scottish Fishery Board's Seventh Annual Report*, Part 3, p. 367.

[3] Arctic Regions, Vol. 1, p. 469.

lie quite motionless for hours at a time.'[1] I have in my possession a large number of log-books of whaling voyages to the Greenland Sea and do not find a single instance recorded. The recently-published log-books of Captain Scoresby, Sr., tell the same tale.

(2) Whales, presumably asleep, and deeply or entirely submerged, are sometimes run into by ships. An interesting instance is recorded in one of the recently-published log-books of Captain Scoresby, Sr.[2] The entry reads as follows (April 28th, 1791) : ' the ship (the *Henrietta* of Whitby) struck, as if she had struck a piece of ice ; being at the mast-head (*i.e.* in the " crow's nest ") at the time (I) looked astern and (saw that) a whale was laid out without motion (at the surface of the water) ; lowered a boat, but she (the whale) settled (*i.e.* sank down) before it could get to her.'

(3) Many of the old whalers who were, it may be supposed, familiar with the habits of the Greenland whale appear to have been of this opinion. According to his log-books, Captain Scoresby, Sr., when the whales were scarce, sometimes sent his men on the ice to make a noise and disturb the whales which he believed to be sleeping underneath. One entry reads as follows (12th July, 1820) : ' sent away (*i.e.* lowered) four boats and (sent) the rest of the crew on the ice, to make a noise, in case any " fish " (*i.e.* whale) was asleep underneath.' Another reads (30th June, 1822) : ' called all hands to make a noise, by way of disturbing and setting out the fish underneath (? recently) we have had many proofs of their sleeping under the ice.'[3]

Again, my father, a very experienced whaler, in some notes published by him shortly before his death, in 1986, says, ' Whales can sleep as well under water as they can at the surface. I have often seen them disappear under (a field of) solid (*i.e.* unbroken) ice for many hours at a time.'

I have stated that whales probably usually sleep under water partly to avoid being molested by birds and I now come to the question : Is a whale asleep, at the surface, liable to be attacked by birds?

(1) Whales and oceanic birds (albatrosses and petrels) have the same geographical distribution and flying about over the surface of the sea, as is their wont, these birds must frequently come in sight of whales and get opportunities of attacking them. Moreover, their keen vision and rapid flight must enable them to quickly see and reach a whale, and when armed with a powerful beak, as some of them are, they must

[1] Scottish Fishery Board's Seventh Annual Report, Part 3, p. 366.

[2] Log books of Captain Scoresby, Sr. (1791-1822) published in fac-simile by the Explorers' Club of New York, 1916.

[3] The ice here referred to was, doubtless, an unbroken field or floe.

be able to inflict a painful wound and, perhaps, remove a piece of skin and fat.

(2) Oceanic birds are extremely fond of a bit of whale blubber and they will run great risks to obtain it. These birds have, therefore, a motive for attacking whales. Hear what Scoresby has to say about the Fulmar Petrel. ' Fulmars are extremely fond of the fat of the whale. Though few should be seen when a whale is being captured, yet, as soon as the flensing process commences, they rush in from all quarters and frequently accumulate to the number of many thousands. They then occupy the greasy track of the ship and, being audaciously greedy, fearlessly advance within a few yards of the men cutting up the whale. If, indeed, the fragments of fat do not float sufficiently away, they approach so near the scene of operations that they are knocked down with boat-hooks in great numbers and sometimes taken up by hand.' [1]

(3) Scoresby, to whom I make no apology for quoting so often, says that ' when carrion is scarce, the fulmars follow the living whale.' [2] He also says that the Greenland whale is afraid of the fulmar and that when one alights on its back ' it sets off in great agitation and terror.' [3] On one occasion, when a boat was approaching a whale which was lying at the surface and when the harpooner was about to strike his harpoon into the animal's back ' it sank at the moment in a fright, occasioned, not by the approaching boat, but by a fulmar's darting on its back and plunging its beak into its skin.' [4] Manby also says that Fnlmar's also pursue Whales.[5]

(4) A whale lying motionless at the surface (*e.g.* a whale asleep) is at the mercy of a bird. In these circumstances the whale's only protection is its skin. In the right whales the skin is thick, but in the Fin-whales or ' Finners ' it is very thin and the coveted blubber lies very near the surface.[6]

Is the dorsal fin of the Fin whales a protection against birds? Is it a kind of periscope? And is one of its functions the advising of the whale when it is motionless and floating upwards, which must sometimes happen, that its tender back is about to be exposed and that it is time to sink down again or get under weigh?

I also wish to refer to certain rudiments met with in the dorsal region of the porpoise. These rudiments suggest that

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[1] Arctic Regions, Vol. 1, p. 529. [2] Arctic Regions, Vol. 1, p. 531.
[3] Arctic Regions, Vol. 1, p. 474. [4] *Journal of a Voyage*, p. 125.
[5] *Journal of a Voyage to Greenland in* 1821.
[6] In the Greenland whale the epidermis is about an inch thick and the ' Finners ' not more than an $\frac{1}{8}$in. In the calf of the Greenland whale the epidermis, according to Scoresby, is about 2-in. in thickness. In the case of a calf killed in 1811, the epidermis was $1\frac{7}{8}$in. (See a log-book preserved in the Whitby Museum).

at one time the backs of whales were not as defenceless as at present, but were protected by bony plates and that their winged adversaries were more formidable than at the present time.[1]

I conclude by referring to certain mysterious and hitherto unexplained wounds found in the skins of Blue and Fin whales killed in South African waters.[2] These wounds are situated on the dorsal surface towards the tail and look as if they had been inflicted one at a time. They also look as if a piece of tissue about the size and shape of half a hen's egg had been removed and as if some creature had enjoyed a repast at the expense of the whale. In whales killed farther south in the neighbourhood of the ice these wounds occur as partially healed sores or as scars. Is the culprit a bird? Is the whale attacked while asleep at the surface with its head submerged and only the hinder part of its body exposed, and are the wounds single because when the whale is attacked and roused from its slumbers it sinks down or gets under weigh in self-defence and the culprit is not given a second chance?

## NORTHERN NEWS.

Prof. F. E. Weiss's presidential address on 'Variegated Foliage' appears in the Society's *Proceedings* recently issued.

Between 4,000 and 5,000 British butterflies and moths collected by the late J. T. Wigin have been purchased by the Leeds Museum.

A boulder of Mountain Limestone has been found in Prince Street, Bridlington, and is believed to be a relic of the Ice Age, and 'dates from 10,000 to 15,000 B.C.'

The services of a water diviner at Reighton and Speeton were recently declined. At the same meeting 'the Shepherd of Israel' guaranteed rain for £100. This was also refused.

Mr. W. C. Sprunt, recently appointed to the Art Gallery and Museum at Doncaster, formerly at the Batley Museum, has accepted the post of Curator of the Museum at Warrington.

We learn that recently at Acomb, near Hexham, an underground spring was discovered by a water diviner, and 'the announcement was greeted with delighted smiles and cries of relief.' But have they got it?

A former President of the Union, the late W. H. St. Quintin, has left property to the gross value of £355,000, and has bequeathed £250 to the Yorkshire Philosophical Society, and £100 to the Royal Society for the Protection of Birds.

We received from Captain T. Dannreuther, of Hastings, a summary of the various insect migration records made by members of the South Eastern Union of Scientific Societies. This, as was pointed out at the meeting of the British Association at Leicester, is a particularly useful piece of work, and it is suggested that any records for Yorkshire should be sent to Mr. W. D. Hincks, 46 Gipton Wood Avenue, Harehills, Leeds, who will summarise them and forward the summary to Captain Dannreuther.

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[1] See Beddard's *Book of Whales*, p. 31.

[2] See Macintosh and Wheeler's *Discovery* Report on Blue and Fin whales.

# In Memoriam.

## Mr. A. I. BURNLEY.

By the untimely death of Mr. A. I. Burnley, of Scarborough, on October 4th, the Yorkshire Naturalists' Union has lost one of its warmest supporters, while to the Scarborough Field Naturalists' Society the loss is indeed a sad one. For over thirty years he had been one of its stalwarts. His love of nature and enthusiasm for investigation were unbounded. He had long been known to members of the Union as the

authority for the flora of the Scarborough district. As Botanical Recorder for the S.F.N.S. he determined, shortly before the war, to visit every locality where any comparatively rare plant was reported to grow. This he carried out within a radius of fifteen to twenty miles. All his work was on this plane.

When, in 1917, Mr. Burnley, already well-known locally as a teacher, was invited to take the post of Geography Master at the High School, he immediately developed an extraordinary enthusiasm and came to be described as a pioneer in geographical teaching. He had already mastered in the field every detail of Professor Kendall's work on local glaciation. He now extended his studies to the Pennines, the Lake District, Scotland, and the Continent, notably the

Pyrenees and the Alps, which he visited frequently, and with whose glacial phenomena he became very familiar. All his results found their way to the Naturalists' Society. He was an excellent photographer and some of his photographs are reproduced in Kendall Wroot's 'Geology of Yorkshire.' It was indeed a passion with him to record with his camera whatever of beauty he encountered in nature.

He made hundreds of beautiful lantern slides, well-known to members of the Union. They illustrated not only wild flowers in their natural surroundings but also the physiography and geology of the places he had visited, in a way which showed his gift for his work.

Mr. Burnley was a native of Stanley, near Wakefield, and a product of Wakefield Grammar School. He went to Scarborough in 1901, on leaving St. John's College, York.

He became Local Secretary for North Yorkshire of the Yorkshire Naturalists' Union. He was a member of the Committee of the Scarborough Field Naturalists' Society, of which he was a Past President, and for twenty-one years he was Joint Honorary Secretary of the Scarborough Philosophical and Archæological Society. In all of these capacities he did yeoman service, but his greatest happiness was in the society of friends in the open country or in his beloved garden with his rock plants.

Members of the Union throughout this country will deeply regret the passing at so early an age—he was only 54—of a keen naturalist and a kind and generous man ; and will extend their deep sympathy to his widow and his daughter. Mrs. Burnley shared in a very unusual degree all his enthusiasms and his journeyings. Miss Winifred Burnley, following in her father's footsteps, is a student at Bedford College, London, specialising in geology.

D.W.B.

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*The Natural History Society of Formosa* at the Faculty of Science and Agriculture, Taihoku Imperial University, Taihoku, Japan, is anxious to exchange its publications with any English Institution of a similar character. Its Journal is published bi-monthly.

According to the Sixty-second *Annual Report of the Public Libraries Art Galleries and Museum Committee of Rochdale,* during the year 136 schoolchildren in seven parties have attended the museum as part of their school work, and the Rochdale Field Naturalists' Society assisted with exhibitions of local wild flowers during the summer months.

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E. M. Marsden-Jones gave a paper to the Linnean Society recently on *Ranunculus ficaria.* Observations were made to ascertain the frequency and object of the visits of insects. A list of forty-eight species was obtained, comprising Coleoptera, Hymenoptera, Lepidoptera and Diptera.

## RECENT GEOLOGICAL RECORDS FROM EAST YORKSHIRE.

The following geological specimens have been obtained recently, and as some are additions to the lists* and others are particularly interesting specimens, we have pleasure in recording them.

CHALK H.P. ZONE.

**Pteria* sp. Kiplingcotes.

Four *Infulaster excentricus*. Kiplingcotes.

*Aptychus of *Scaphites*. Kiplingcotes.

*Holaster placenta*. Kiplingcotes.

*Offaster pillula*. Kiplingcotes.

M.CA. ZONE.

*Scalpellum maximum*. South Landing. Rowe does record this.

**Ophiuroids*. South Landing to High Stacks.

**Calliderma* sp. South Landing to High Stacks.

Collection of 13 *Crania egnabergensis*, in a line. From M.ca. Zone. South Landing; probably originally attached to a Serpulid or something now decayed.

*Metopaster* sp. (?). High Stacks, South Landing.

A.Q. ZONE.

**Actinocamax*, without slit, although guard is perfect. Danes' Dyke.

**Scaphites binodosus*, showing aperture perfect. Bessingby.

*Micraster coranguinum*. Danes' Dyke to Sewerby.

**Cephalites* sp. *aff. bullatus*. Danes' Dyke.

**Craticularis* sp. *aff. roemeri*. Danes' Dyke.

Undescribed *Hexactellinid*, allied to *Ventriculites*. Danes' Dyke.

CORANG. ZONE.

*Actinocamax* sp. ? from Corang. Zone. South Landing. This specimen is striated on outer and inner layers.

HOL. SUB. ZONE.

*Lima* sp. Rifle Butts, Market Weighton.

M. CORTEST. ZONE.

*Bourgueticrinus*. Bud, Market Weighton.

*Young *Siphonia koenigi*. Little Weighton.

Possibly a young *Enoploclytia*. Riflle Butts, Market Weighton (identified by Mr. Withers).

CORALLIAN.

Two small reptile ribs. Filey Brigg.

KELLAWAYS.

*Strophodus* tooth. Cayton Bay.

CORNBRASH.

*Barbatia* with ligment perfectly preserved. Cayton Bay.

MILLEPORE.

*Strophodus* tooth.

*Barbatia*,. South Cave.

SPEETON CLAY.

Various fossils found *in situ* in B. beds at Speeton, and from probably Beds C and D, *Omithella longa* Roemer and *Rhynchonella cf. walkeri* Dav.

LIAS.

Large Belemnite. *A. serpentinus* zone. The Peak.

Those marked with asterisk are apparently new records. The specimens are temporarily exhibited in the Museum at Hull, where students may see them during the next month or two.

C. W. WRIGHT.

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* See classified List of Organic Remains from the Rocks of the East Riding of Yorkshire. *Proc. Yorks. Geol. Soc.*, Vol. XVIII, Pt. I, 1909. pp. 4-71.

## NEWS FROM THE MAGAZINES.

*The Proceedings of the Leeds Philosophical and Literary Society*, Vol. II, Part X, recently published, contain an article on ' The Types of Fossil Fishes in the Leeds City Museum,' by J. A. Moy-Thomas.

Among the obituary notices in *The Quarterly Journal of the Geological Society* recently published we notice the names of George Barrow, J. W. Gregory, and A. Wilmore, all having been associated with the geology of the north of England.

*The Entomologist* for September includes '*Morpho achilles* L.' by W. G. Sheldon ; ' On the types of certain Butterfly Genera,' by F. Hemming ; ' Notes on Braconidæ,' by C. Morley ; ' Bees of the genus Colletes from South Africa,' by T. D. A. Cockerell ; and numerous Notes and Observations, including migration records.

Dr. J. R. Garrood has reprinted his paper on ' An Iron Age and Romano-British Village in Huntingdonshire,' from *The Proceedings of the Cambridgeshire and Huntingdonshire Archæological Society*, Vol. V, and the illustrations he gives show that the earthenware vessels he has obtained have resemblances in the Yorkshire barrows preserved in the Mortimer Collection at Hull.

*The Entomologist's Record* for September contains ' Notes on a Visit to the Northern Transvaal,' by J. S. Taylor (interesting notes on Lepidoptera, Coleoptera and Rhynchota) ; ' Paris and Mouthier (Doubs) in July-August, 1932,' by E. B. Ashby ; ' Zygæna, Grypocera and Rhopalocera of the Cottian Alps,' by R. Verity ; and Supplement, ' British Noctuæ,' by H. J. Turner. There are also a few Notes and Observations.

The volume of *Abstracts of Proceedings of the Geological Society of London*, recently published, contain summaries of and discussions upon the following papers of interest to northern readers : ' The Skiddaw Granite and its Residual Products,' by Dr. C. S. Hitchen ; ' The Corallian Rocks of Yorkshire—I, The Howardian Hills,' by Dr. V. Wilson ; and ' The Lower Palæozoic Rocks of Austwick and Ribblesdale,' by Prof. W. B. R. King and Mr. W. H. Wilcockson.

We learn from *The Journal of Ecology* recently issued that Mr. W. B. Crump, of Leeds, has presented his collection of lantern slides, prints and negatives of British vegetation to the British Ecological Society. Mr. Crump was one of the pioneers in the study of vegetation in this country in the last decade of the nineteenth century, and later a member of the British Vegetation Committee, from which the British Ecological Society sprang. Many of the photographs were taken in the northern counties.

In the Summary of Progress of the Geological Survey for 1932 is a useful record of the variou publications in which the Geological Survey specimens have been figured and described. Among the list we notice *The Naturalist, The Transactions of the Leeds Geological Association*, and *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society*. In the same publication C. E. N. Bromehead gives an account of the geological survey work in the York District ; W. B. Wright refers to Lancashire ; T. Eastwood reports on the Cumbrian District ; and R. G. Carruthers on Northumberland and Durham.

*The Entomologist's Monthly Magazine* for September contains ' Two new species of Promachus (Dipt. Asilidæ) from Madagascar ' (with figures), by B. M. Hobby ; ' Notes on the Aulacocyclinæ (Col. Passalidæ),' by J. R. Dibb and ' The genus *Monochamus* Latr. in Britain (Col. Cerambycidæ),' by K. G. Blair (gives numerous records from *M. gallo-provincialis* Oliv., including one from Scarborough, and three records for *M. quadrimaculatus* Mots.), and ' New Species of Staphylinidæ (Col.) from Japan,' by M. Cameron. There are also short notes including ' Hymenoptera Aculeata from Bedfordshire,' and ' Dumfriesshire Sawflies.'

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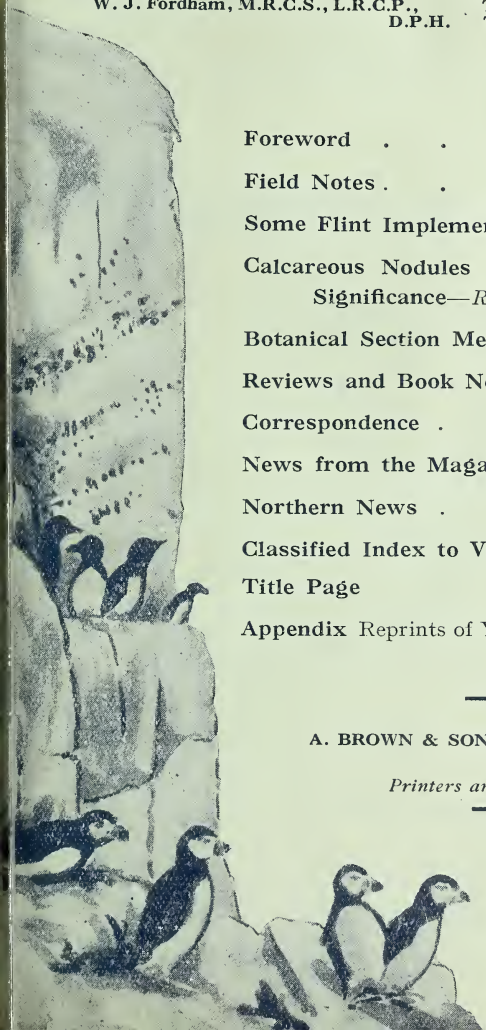

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# FOREWORD

**1833—1933.**

It will be of interest to our members and readers to know that the true forerunner of our journal was commenced in January, 1833, when *The Field Naturalist*, edited by James Rennie, made its appearance. Several similar undertakings followed this venture, and all may be regarded as in the direct line of succession up to the date August, 1875, when the journal as now constituted appeared. From that date *The Naturalist* has been published regularly and, considering the long period of years, with few changes in editorship. It is an interesting coincidence that Messrs. Sheppard and Woodhead completed and closed their twenty-one years of highly successful work as joint editors at the centenary date. A full history of *The Naturalist* up to 1915 appears in Mr. Sheppard's volume entitled *Yorkshire's Contribution to Science*.



DEC 21 1933

## FIELD NOTES.

**A Tame Robin.**—The tameness of Robins is almost a commonplace: but I think the following is worthy of note. For four winters in succession, a fairly long period for a small bird in the wild, a Robin has attached itself to the bookstall in Ilkley railway station, where it may be seen daily. In late March or April it absents itself for nesting purposes, and is not seen throughout the summer, nor until about September. It enters and departs through a small hole in the roof, and it appears to be quite indifferent to the noise of the trains, and the people about. The attendants feed it, and chiefly on broken biscuits. I make it out to be a female.—H. B. Booth.

**Hawk at Patrington.**—Having had reported to me that an unfamiliar Hawk had made its appearance at the clough at Patrington, I was fortunate enough on the morning of Tuesday, November 7th, in my third attempt, at seeing a very fine Hen Harrier make a kill in some long grass, and I got up to within comparatively short distance of it, with field glasses in my hands. I had the pleasure of seeing it very closely. This is the second time I have seen a Hen Harrier in a state of 'feræ naturæ.' I watched it for about three-quarters of an hour, and left it still hunting. As I watched it, it was mobbed by two or more carrion Crows whenever it was in the air, but it eluded them whenever it was so inclined, by a flight that was more like a continuous swaying motion, always from side to side, with very little wing movement. Although at the end of each glide it stood poised for a moment, it never hovered. Twice it settled on the top branch of a hawthorn bush, but it generally sought the long grass. The clough keeper, Mr. S. Drewery, told me that it has been there now for nearly three weeks, and he has seen it almost daily, that there were originally two, but that one whose rump was more darkly coloured had not been seen of a day or two.—Chas. J. Proctor.

---

## SOME FLINT IMPLEMENTS FOUND IN CRAVEN.

CHRIS. A. CHEETHAM.

The paper on Tardenoisian sites by Mr. T. Deans in the October number has suggested to me the desirability of getting casual finds of flint implements definitely recorded and so giving a better knowledge of the amount that have been seen in some parts of the country that are not so well known in this connection as is the East Riding. I have found worked flints on the hill above Kilnsey Crag; by the side of upper Gordale Beck; On Smearside; on Moughton; on Norber and above Trow Ghyll.

# CALCAREOUS NODULES ('COAL BALLS') AND THEIR SIGNIFICANCE:

R. CROOKALL, D.Sc., PH.D.

(*Continued from page* 256.)

The 'roof' nodules in Lancashire contain a greater proportion of land than of swamp-plants, though some swamp-plants are represented. The 'roof' nodules from the Yorkshire area, on the other hand, contain swamp-plants.

It may be pointed out that the field of research provided by British 'coal balls' has been so thoroughly and expertly investigated by Williamson, Scott, Seward and others that, at the present time, new forms of plant are seldom found. It is only when fresh localities are discovered that any considerable proportion of new genera and species may be expected. It has been found that only about one per cent. of 'coal balls' sectioned from the old localities contains a plant structure of sufficient importance to warrant further sectioning.

The following is a comparison of the botanical contents of 'roof' nodules from Lancashire.

| | 'FLOOR' NODULES. | 'SEAM' NODULES. | 'ROOF' NODULES. |
|---|---|---|---|
| SWAMP-PLANTS. | | | |
| (1) Clubmosses *Stigmaria* (roots and rhizomes) | The only contents of floor nodules | Very common | Very rare |
| *Lepidodendron* (chiefly stems) | — | Very common | Rare (and represented by different species from those in 'seam' nodules) |
| (2) Sphenophyllales (chiefly leafy stems) | — | Common | Absent |
| (3) Pteridosperms (seed-ferns, chiefly *Lyginopteris*—leafy stems) | — | Very common | Leaves only |
| (4) Equisetales ('Horsetails'—chiefly leafy stems) | — | Common (*e.g. Calamites communis*) | Very rare (and different species—*e.g. C. ramosus*) |
| (5) Ferns (Botryopterids—chiefly stems and leaf-stalks) | — | Common | Absent |
| LAND-PLANTS. | | | |
| (1) Pteridosperms (Seed-ferns—Medulloseæ—chiefly stems, leaves and seeds) | — | Rare | Common |
| (2) Gymnosperms (*Cordaitales*—chiefly stems, leaves and seeds) | — | Rare | Common |

The three types of 'coal ball,' as found in Lancashire, their contents and characteristics, are compared in the accompanying table, together with the conclusions to be drawn.

| Observation. | Inference. |
|---|---|
| 'Floor' Nodules contain only roots and rootlets (Stigmaria), with mud, but no marine shells (*goniatites*, *Aviculopecten*, etc.). | They were *formed in the original soil* of the coal forest. |
| 'Seam' Nodules represent a mass of numerous plant remains penetrated by roots, but which are free from mud or shells. | 'Seam' nodules were *formed in the coalifying vegetable debris* and were not transported by water. Decaying plants formed a peaty mass on which their descendants lived. |
| The surface of the nodule is not smooth, as has been maintained. Stems which occur in a nodule may extend into the surrounding coal. Even soft plant tissues are often not torn or crushed. | The nodules, as such, were not carried into the seam by the agency of water, but *formed in situ* on the swamp in an estuary. |
| The roots contain exceptionally large air spaces, adapted to facilitate breathing in the muddy soil. | The plants found in 'floor' and 'seam' nodules *must have grown in a swamp.* |
| Leaves which are preserved in the nodules have sunken pores to restrict the amount of water lost. | Though water was abundant, the plants must have lived in a moist *soil containing salts or organic acids.* |
| 'Roof' Nodules may contain only one plant fragment. This is not penetrated by roots. The mud is fine and evenly bedded; marine shells are present; quartz grains are absent. | The single plant-fragment was *carried by water* to its present position. The material composing the nodule, however, did not accumulate on an area which was then an estuary or lagoon or on a shore, but *some distance from land, on the bed of the sea.* |
| The plant tissues preserved are mainly those resistant to decay (*e.g.* wood); they are sometimes torn or crushed. | Only resistant tissues could withstand transport and even these may have been damaged. |
| The air spaces in the roots (and other features) are not abnormally developed. The leaves do not bear sunken stomata. | The included remains are those of *land plants* which lived under *normal climatic conditions.* |

There has been some tendency to exaggerate this differentiation of the floras found in 'seam'—and 'roof'—nodules in Lancashire, the 'seam' nodules being predominantly swamp vegetation and the 'roof' nodules containing certain landforms. In addition, some writers have thought that such

differentiation was a general phenomenon where calcareous nodules occur.

It will be seen, however, from the above table, that the two floras in Lancashire are by no means mutually exclusive. The differences are proportional rather than absolute. In Yorkshire and on some Continental horizons the 'roof' as well as the 'seam,' nodules contain swamp plants.[1] Other considerations must also be taken into account. For example, the Cordaitales are rarely recorded from the 'seam' nodules of Lancashire, yet Cordaitean wood (with the characteristic multiseriate pitting) is often seen in the fusainised portions of Palæozoic coals, and has been recognised in the vitrainised constituents. Again, the differences between fresh, brackish, and salt water forms are by no means sharply marked off (see p. 7).

Dr. Stopes and Professor Watson have admirably described the mental picture of the series of events which led to the formation of the Lancashire calcareous nodules: 'Groves of large trees with smaller herbs and ferns finding place between and around their stems grew in the flat swampy levels between the higher ground and the sea. The water round their roots was brackish or salt, as is the water in the Mangrove swamps to-day, and into its quiet pools and shallows twigs and branches, stems, leaves and fruits fell or were blown. These fragments sank into the mass of debris already saturated and were shut out from the atmosphere and preserved by the salt water in which they lay immersed. Parts of the plants decayed and thus liberated the organic carbon, which began its slow task of reducing the sulphates and depositing them as insoluble carbonates. This process continued long without the entry of impurities or the deposition of anything but plant remains, and the rootlets of the living plants wandered among the dead ones, finding their way even through the heart of their stems or seeds.

'At the same time the land was slowly sinking, and when several feet of debris had accumulated the level sank more abruptly till the plants were well submerged and the place where the forest trees had lived was covered by the waters of an arm of the sea. Over them was deposited fine mud, with the shells of *Goniatites* and *Aviculopecten* which lived and died in the waters. The plant masses below were continually withdrawing the sulphates of lime and magnesium from the sea water and depositing them as carbonates round the many centres started among the fragments of plants. The supply

[1] Crookall, R., in 'The Country around Huddersfield and Halifax,' *Mem. Geol. Surv.*, 1930, p. 166. The writer intends shortly to publish an account of the stratigraphical and geographical distribution of British Carboniferous Petrifactions.

of salts was inexhaustible, for new water mingled continually with the old and brought fresh sources of mineral to petrify the plants. Thus in the heart of the masses of coal were formed large and small concretions of carbonate, some regular as balls and very large, others minute and uniting together to form wisps or sheets of stone lying in the coal.

'The stony masses hardened, and as the weight above gradually pressed down the soft plants which would ultimately form the coal, they withstood the crushing uninjured, the delicate tissues embedded along with scraps of young plants which had but begun life, and were at once preserved alike from further growth and from decay.

'In the sea above, the currents carried fragments of plants from the neighbouring land, brought by the streams from the higher ground. These sank in the muddy floor and were gradually crushed by the silt collecting above them, till they were flattened as impressions in the beds which afterwards formed shales. Others, sinking upon the floor of the sea where the many decaying animals liberated so much carbon that the sulphates in the water were converted into carbonates, were slowly petrified—but not before the vicissitudes of their journey had partly destroyed and torn them, yet those of their tissues which escaped these ravages were so well preserved by the sea water that their every cell was petrified by the deposited carbonates, which formed concretions round them and enclosed at the same time so many shells.

'These drifted plants, whether their fate was to be enclosed in the preserving nodules or to be crushed into the shales, had principally come from regions different from those which produced the half-formed coal now lying immediately below them.

'Slowly they too were covered by the fine deposits which collected gently over them, until the sea bottom rose again to form a new land. All this time the plants were preserved in the coal balls without disturbance or hurt, and although the coal-forming debris had been pressed down into coal which was now but a foot in thickness, they remained uncrushed in their original form.

'This has happened with slight variations many times in the course of the history of the world; but only where the land rose and sank gently and the plants were covered as they fell in a still inlet of the sea. Where the plants were hurried down to sea and collected together swiftly and then covered by a sandy or estuarine deposit forming rapidly, there no "coal balls" are found.

'Thus, the "coal balls" in the coal are the relics of a forest which grew quietly in a swamp in the place where they are now found, while the plants in the shales and in the roof

nodules above had drifted out to sea from other districts and bear in the character of their structures the impress of the different type of land on which they lived.'

Cell-structures seen in 'Coal Balls.'—While the wood found in many coals of Tertiary age shows growth (so-called annual) rings, due to the alternation of the small thick-walled wood with the large thin-walled wood (the former usually being formed in the autumn and the latter in the spring), the wood found in Palæozoic coals (mummified) and in 'coal balls' (petrified) rarely contains such structures. Palæozoic wood is usually thin-walled and possesses large lumens. Thick-walled ('sclerotic') cells, in mass forming the tissue known as sclerenchyma, though common in Palæozoic coals, are usually localised. They occur occasionally in pith or leaves (*e.g.* in *Cordaites*), but are more frequently found in the cortex of the stems (*e.g. Lyginopteris* and *Medullosa* among the Pteridosperms and *Sigillaria* and *Lepidodendron* among the Lycopods). The lumens of these cells are almost, or quite, closed by the thickening material.

Again, while the wood of many Tertiary coals may contain large areas of resin-filled tissue, the resins found in Palæozoic 'coal balls' and woods (*e.g. Cordaites*) are more disseminated throughout the plant body.

The Value of Fossil Plants in Stratigraphy.—It has been pointed out by Dr. D. A. Wray[1] that 'Stopes and Watson have clearly shown that the flora of the roof shales may differ considerably from that of the underlying coal seam.' From this Dr. Wray concludes that, 'The employment of plant remains as zonal indices is [further] complicated by ecological considerations.'

There can be no question that the stratigraphical use of fossil plants is complicated by ecological conditions. But, in my opinion, Dr. Wray's argument passes from the particular to the general.

In the first place, as has been observed above, not all 'roof' nodules contain land plants. The presence of land plants in certain 'roof' nodules is clearly related to the proximity of the locality to relatively high land. For example, where the material composing the roof of a seam was laid down near a low-lying tract of country, the plants included in the 'roof' nodules, though more or less drifted into position, would be swamp plants which were not markedly dissimilar from the vegetation which went to form the seam itself (and the enclosed 'seam' nodules). Where, on the other hand, the shore-line was steep, the remains of land plants (as well,

[1] Wray, D. A., 'The Major Subdivisions of the Coal Measures in Yorkshire,' Summ. Prog. for 1931, *Mem. Geol. Surv.*, 1932, Pt. II, p. 60.

possibly, as those of swamp plants) would be petrified in the accumulating sediments.

In the second place, seams which contain 'coal balls' have clearly been affected by somewhat abnormal conditions. Deductions drawn from such seams can be applied to coals which developed 'normally' only with caution.

The writer[1] has expressed the opinion that the plant incrustations found in the immediate roofs of the majority of coal seams are substantially the same as those which compose the seams themselves. It is concluded, therefore, that the 'coal ball' flora of Lancashire does not vitiate the use of plant incrustations in stratigraphy.

The Formation of Coal.—Professor E. C. Jeffrey admits that the strongest argument for the 'peat' or '*in situ*' theory for the origin of coals appears to be furnished by 'coal balls.' But he regards the debris which formed the coals containing 'coal balls' as having accumulated by drift under water. On this point he observes that micro-sections of true peat-coals (which accumulated *in situ* but are regarded by him as very rare) show them to consist chiefly of disorganised wood. On the other hand, thin sections of 'maritime coals' (containing 'coal balls') show them to contain little wood and to consist chiefly of spores embedded in a dark matrix. (Such a dark matrix, composed of smaller decayed debris, occurs in both peat-coals and maritime coals). On this view the so-called 'maritime coals' resemble the cannels and bogheads ('lake-muck coals') and he considers that they were laid down like them, in open water. This is, of course, true of those relatively few seams which were *deposited* in definitely maritime waters. But most coals (even most of the coals containing 'coal balls') *accumulated in Situ.*

The conclusion takes no account of those differences between coals which are usually ascribed to the differences between the biological putrifying agents (fungi and bacteria) and to differences in the periods during which they operated on the vegetable debris. Jeffrey, in fact, does not admit the importance of such activities in the process of coalification. On the other hand, he attributes coalification of the original vegetable debris solely to long continued heat and pressure. This, however, in the opinion of the writer, is negatived by the evidence obtained from the pebbles of coal which occur in Coal Measure sandstones—*i.e.* by the evidence from true 'coal balls.' Such pebbles of coal are of common occurrence in the sandstones of South Wales, Bristol and Somerset, known as the Pennant Rock, and *the coal is uncrushed.* It is evident that *coalification was relatively rapid.* The vegetable

[1] Crookall, R., 'The Lithology and Palæobotany of Certain British Coals,' *Fuel in Science and Practice*, Vol. xii, 1933, p. 278.

debris had been turned into coal and had hardened, and part of it denuded by water and re-deposited in the sand (which, nevertheless, become overlain by deposits including seams of coal). Again, uncrushed stems are occasionally found in coal. They show that pressure was not an all-important factor in coalification. Temperature, similarly, can have caused little differentiation between coals.

Such observations point to factors operating prior to long–continued heat and pressure in the formation of coal. Further, there is abundant evidence of the presence of fungi and bacteria in the plant tissues preserved both in coal and in ' coal balls,' and many other observations point to the conclusion that most (though not all) coals were formed *in situ*. The evidence adduced by Stopes and Watson, received above, must also be taken into account.

It must here be said that the conditions under which various coals were laid down were by no means sharply marked off from each other. Accepting the conclusion of Stopes and Watson that coals which contain calcareous nodules were deposited in brackish water, there is reason to believe that most seams which do not contain such concretions were laid down in brackish rather than in fresh water. The aquatic worm *Spirorbis* is commonly found attached to the plant incrustations found in the roofs of seams from which ' coal balls ' are absent. Yet *Spirorbis* must be regarded as a typically marine genus, and its presence at least suggests brackish-water conditions. Even the so-called ' fresh-water ' molluscs (*Carbonicola*, *Anthracomya* and *Naiadites*) found in the roofs of many seams which do not contain calcareous nodules are of doubtful habitat. *Naiadites*, in particular, appears to have favoured brackish water. Of the other forms some probably favoured fresh—and others brackish—waters.

We must, therefore, conclude that most seams which contain ' coal balls,' like the majority of other seams, did not originate by drift ; that the vegetable debris in these, as in most other cases, accumulated *in situ*.

## SUMMARY.

*Calcareous nodules* (' *coal balls* ') *consisting mainly of the carbonates of lime and magnesia, occur in association with a few seams of coal, chiefly in the Lower Coal Measures. They may be found in the fireclay floor of the seam* (' *floor* ' *nodules*), *in the coal itself* (' *seam* ' *nodules*), *and in the shaly roof of the seam* (' *roof* ' *nodules*).

*They represent concretions formed in and around plant remains, the vegetable tissues being petrified. The plants preserved in* ' *floor* ' *and* ' *seam* ' *nodules usually grew* ' *in situ* ' ; *those in* ' *roof* ' *nodules drifted into position. The amount of drift, however, depended on physiographical conditions, so that some* ' *roof* ' *nodules may include certain land forms while others contain swamp-plants.*

*Whereas the plants which formed most coals grew in fresh—or, more*

*frequently, in brackish—water swamps, those which formed the coals containing calcareous nodules grew in swamps, the waters of which were more definitely salt.*

*'Floor' nodules contain only roots. 'Seam' nodules are composed of petrified swamp-plants. Some, but not all, 'roof' nodules include plants; these may be either swamp–or land-plants.*

*The absence of growth-rings from the wood of the stems suggests a climate which was of fairly uniform temperature.*

*A study of some nodules suggests that eleven to twelve feet of vegetable debris was eventually reduced to form each foot of coal.*

*'Floor' and 'roof' nodules contain a much greater proportion of silicates than 'seam' nodules; this represents sand and accounts for part of the ash in coal.*

*The fact that some 'roof' nodules contain land plants does not militate against the stratigraphical use of plant-incrustations found in the immediate roofs of coal-seams in general.*

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## BOTANICAL SECTION MEETING.

This section again met at Leeds University on the kind invitation of Professor Priestley. In the afternoon the reports of the various committees were presented and discussed and the various officers and committees were considered. At the opening, the Chairman, Professor Priestley, referred to the loss the section had sustained by the death of the Recorder for North Yorkshire, Mr. A. I. Burnley, of Scarborough, and the members showed their sympathy by standing. Mrs. Priestley, with the aid of Mrs. Grist and other ladies, supplied a welcome cup of tea and afterwards Dr. Pearsall spoke on work he had been engaged on for the last two years in the Lake District on the question of light effect at various depths of water. He contrasted his results with those obtained in dense woodland shade and showed the advantage obtained by the use of the Photo-voltaic cell.

He instanced the differences between Windermere, Ennerdale and Bassenthwaite and suggested the factors contributing to these differences and concluded with references to changes which are still taking place in Windermere in which lake various investigators have recorded work since 1908.

Miss Scott had arranged a series of microscopes showing an interesting but unfortunately rare alga, *Hydrodictyon reticulatum* and these she explained and spoke of the alga in all its various stages.

A very hearty vote of thanks was given to Professor and Mrs. Priestley and to the lecturers and others who had helped to make the meeting so successful.

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## REVIEWS AND BOOK NOTICES.

**Bird Notes and News, Summer Number, 1933,** p. 154. Barn Owls in W. Yorks. : ' A lair of Barn Owls are nesting and rearing four young ones in a barn within two miles of Huddersfield Association Football Field. Two members of the Brighouse Naturalists' Society were, in their work as masons, engaged in strengthening the walls of the old barn within five yards of the nest. The birds took no notice of them, one sitting on the nest and the other on the rafters close by during the whole time. . . . . The farmer promised to allow no one else admission until the owlets were ready to fly.'

**Lions, Wild and Friendly,** by **E. F. V. Wells, F.R.G.S., F.L.S.,** pp. xii+112 with 55 illustrations in photogravure. Cassell, 8/6. The author of this beautiful work turned from the destruction of big game in Africa to a study of the habit of the living animal and this book alone is amply justification for the change. It deals entirely with lions, the author and his wife having reared thirty of these fine creatures. He has had the good fortune to carry out his studies in the native haunts of the lion and has many interesting and original observations and conclusions to record. The illustrations are very fine and although titles are lacking throughout, the text usually supplies the deficiency quite well. These photographs of fine, healthy, live lions and their cubs are infinitely to be preferred to those of carcases of animals shot by big game hunters.

**Children's Books** on Natural History are a somewhat recent development and three have recently appeared which merit distinct commendation. One of these is **Taddy Tadpole,** by **Olwen Bowen** (Nelson, 2/6), which deals with life in a pond and the adventures of a tadpole

therein. This is primarily a story, well illustrated and informative. Our youngest reviewer's only objection to it is that one does not fish for sticklebacks with flies, these lures being reserved apparently for trout and salmon. In Messrs. Burns Oates Nature and Science Series (2/6 each) there are two new arrivals, **The Children's Story Book of Bees,** by **Gareth H. Browning,** and a **Zoo and Holiday,** by **Gertrude Gleeson.** These maintain the standard of this series, and are both very readable. The former is perhaps more suitable for older children, with a distinct naturalistic bias. The second book is an extremely lively one and is not, as is often the case, overcrowded with animal names. The form of these three books is excellent, the type clear and they are to be recommended for the Christmas season.

**The Natural History Magazine** (Vol. IV, No. 28), for October (British Museum, 1/-) contains contributions on ' Dugongs from Mafia Island and a Manatee from Nigeria,' by Guy Dollman ; ' A Visit to the Islands in the Gulf of Guinea,' by W. H. T. Tams, and the fourth instalment of ' Behind the Scenes in the Museum,' by W. E. Swinton, which gives an excellent idea of the organisation necessary and of the range of collections available in the British Museum.

**The Genealogy of Love,** by **C. Thesing,** translated by **Eden and Cedar Paul** (Routledge, 15/- net.). This book deals with the evolution of sexual behaviour from the stage of the unicellular animal to that of human beings. It deals first with the development of reproductive cells and with the manner in which the earliest forms of life give way to sexual forms, hermaphrodites and intermediates and ultimately to individuals of different sexes. The methods of reproduction discussed are of all types and include insects, spiders, amphibians, fishes and a whole range of birds and mammals, including man. The book is primarily a record of fact and there is little or no central thesis, except that of the general development of reproductive organs and habits. It is well written and translated, though the title hardly, perhaps, does justice to its scientific character. The form and illustrations are excellent, and it is very readable while embodying a fund of unusual information.

**The Life of Edward Jenner,** by **F. Dawtrey Drewitt,** pp. xii+152, Longmans 6/- second edition. It is quite likely that comparatively few people of to-day know that Jenner was a really good working naturalist as well as the discoverer of vaccination. This readable volume gives an account of the life of Jenner, his work as a naturalist, and a very complete account of his investigations into the causes and cure of small pox. Opponents of vaccination should, in fairness to the other side, read this temperately stated case for Jenner.

**The Flora of Leicestershire and Rutland,** by **A. R. Horwood and the (late) Earl of Gainsborough,** pp. 976, 32 plates and two folding maps, price 35/- net. (Humphrey Milford : Oxford University Press). This flora was fortunately published in time for the British Association Meetings at Leicester this year. It is a monumental work and evinces abundant evidence of scrupulous care in preparation. It follows the general lines laid down by Wheldon and Wilson's ' Flora of West Lancashire,' but is much more comprehensive. Full geological details and a good map are given, followed by a full account of the plant communities and their detailed distribution. The historical details relating to woodland and grassland are particularly to be commended. It appears that this county is now more wooded than it was in earlier

times, this being apparently largely due to the provision of fox coverts. There is evidence also that the grasslands have improved in quality in the last one hundred and fifty years. Details of the variation in treatment and composition of these grasslands are given. The ecological part of the book is, in fact, of considerable general value to ecologists. A somewhat unusual feature of the introductory chapters is the section dealing with the history of botanical research in the district Biographies of prominent botanists add to the interest of this section and record facts worthy of preservation. Particularly noteworthy is the claim that W. Marshall (1790) was the first English ecologist. The flora itself appears to reach the high standard of the introductory chapters. The details under the different species are very full and the comments often of great interest. The plates illustrating the vegetation of the district are excellent.

**The Woodlands and Marshlands of England,** by **H. A. Wilcox,** pp. 55 and two folding maps, 6/- net. (University Press of Liverpool through Messrs. Hodder and Stoughton). This short monograph centres round two maps which show the distribution of moorland and marshland in England (*a*) in prehistoric times approximately 1800 B.C., and (*b*) as depicted from historical evidence and early cartographers. These maps were thought by a Sub-Committee of the British Association to be so useful that they have been published, though on a somewhat smaller scale (1 : 100,000) than the originals. They have undoubtedly great value and we have to thank Dr. T. W. Woodhead for urging their publication. Almost equally valuable is the account of the principles and evidence from which they have been constructed. This is very judiciously worded and to the reviewer its only fault is its brevity. It would be an excellent thing if interested persons in each part of England would submit this work to the closest scrutiny and attempt to provide the author with more detailed information for which she asks.

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## CORRESPONDENCE.

DEAR SIR,

In reference to the allusion, made by Mr. R. W. Gray, to the circular wounds seen near the tails of whales (*Naturalist*, November, 1933, page 260) I suggest that possibly these may be due to the attacks of some species of lamprey. I do not know if these fish are found in South African waters ; they occur in Australian and South American seas.

Nearly all the tunnies I have examined from the North Sea (nearly 100 in all) have borne upon the hinder part of the body, between the second dorsal and anal fins and the caudal fin, round scars about the size of a half-crown piece, some fresh and raw, others partially or entirely healed up. These I regard as the work of the Sea Lamprey (*Petromyzum marinus*), a common parasitic species in the North Atlantic which often attaches itself by its suctorial mouth to the sides of fishing boats, no doubt mistaking them for the bodies of large fish.

W. J. CLARKE.

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The herbarium of the late Phillip Sewell, of Whitby, consisting of 3,000 specimens of British plants, mostly from the Cleveland District, has been presented to the British Museum (Natural History) by Mr. W. G. Sewell.

## NEWS FROM THE MAGAZINES.

A delightfully-written and well-illustrated account of the Algal Flora of a Leicestershire Pond by Florence Rich appears in the *Transactions of the Leicester Literary and Philosophical Society* for 1932-3.

We see from the press that some Reptilian footprints have been found near Worksop recently which have been examined by the Curator of the Museum and Town Clerk of Worksop. These Permian footprints are not uncommon but what possible justification can there be for the large heading at the top, ' 14,000,000 Years Old '' ?

*The Entomologist* for October contains ' Barro Colorado ; a Tropical Nature Reserve,' by W. G. Sheldon ; ' Additional Notes on the Types of Certain Butterfly Genera,' by F. Hemming ; ' A New Species of Neuræschna (Odonata),' by D. E. Kimmins ; ' British Trichoptera in May and June,' by M. E. Mosely, and numerous Notes and Observations including Migration Records and several records of Colias croceus.

*The Entomologist's Monthly Magazine* for October contains ' New Species of Staphylinidæ (Col.) from Japan,' by M. Cameron ; ' Remarks on some of Motschoulsky's Types of Staphylinidæ (Col.),' by M. Cameron ; ' Neuroptera (sens. Linn) observed in Argyllshire (V.C. Kintyre) in May, 1933,' by K. J. Morton ; ' Mesopsocus laticeps (Kolbe) a Psocid new to Britain ' (with figure), by F. M. Gambles ; ' Descriptions of two new Asilidæ (Dipt.) from the Transvaal ' (with figures), by B. M. Hobby, and ' Two further instances of flies swarming at Rothamsted Experimental Station with some references to this phenomenon,' by H. F. Barnes (a very interesting note) ; ' The British Hemiptera Heteroptera of the Dale Collection,' by J. J. Walker, and several shorter notes, including one on Colias croceus near Carlisle by F. H. Day.

*The Entomologist's, Record* for October contains ' A Butterfly Hunt in South Finland,' by Rev. G. Wheeler ; ' Additional Records of Ants and Myremcophiles,' by H. Donisthorpe, ; ' The early stages of Indian Lepidoptera,' by D. G. Sevastopulo, several scientific notes and the supplement, ' British Noctuæ,' by H. J. Turner.

*Science Progress* for October (Edward Arnold, 7s. 6d.) contains a number of important articles of special interest to North Country naturalists. Professor Boswell, of the Imperial College, has a timely essay on the modern views on the geology of chalk. The theories of sixty years ago have had to be extensively revised, and there are many problems associated with the origin of chalk which have not yet been cleared up. Dr. Aston writes on The Hydrogen Isotope of Mass 2, and Dr. Norman, of the Rothamsted Experimental Station, contributes the substance of a lecture on ' Some Aspects of the Chemistry of the Plant Cell Wall.' Dr. W. T. Astbury, of the Textile Physics Laboratory of the University of Leeds, is already well-known for his important research work. His article on ' The X-ray Interpretation of Fibre Structure ' will be of great interest to scientifically-minded readers, and more especially to those who have been following recent work on molecular architecture as revealed by X-ray examination. The Journal contains several important contributions, extensive notes on Recent Advances in Science, and many book reviews which are of real service.

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## NORTHERN NEWS.

Dr. Cyril Fox, Director of the National Museum of Wales, at Cardiff, gave an address on ' Britain as an Environment for Man ' to the International Congress of Prehistoric and Protohistoric Sciences in London recently. This has now been published by the Museum, and is remarkable for the extraordinary number of maps showing the distribution of barrows, beakers, bronze axes, flint daggers, etc., in Great Britain. Judging from most of the maps, Yorkshire takes a very good share of the records relating to Early Man.

# CLASSIFIED INDEX.

COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators ; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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Page 35, line 35, *for* ' Flixby,' *read* ' Fixby.'

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Circular No. 374.

# Yorkshire Naturalists' Union.

**President:**
JAMES MEIKLE BROWN, B.Sc., F.L.S., F.E.S., Sheffield.

**Local Secretary:**
GEO. B. WALSH, B.Sc., Linthorpe, Stepney Drive, Scarborough.

**Hon. Secretary:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

# The 374th Meeting

WILL BE HELD AT

# ROBIN HOOD'S BAY

for the investigation of

## Ramsdale Beck, Mill Beck, Stoupe Beck, Howdale Beck and Foulsike

DURING EASTER WEEK-END

## SATURDAY, APRIL 15th to MONDAY, APRIL, 17th, 1933

**HEADQUARTERS.**—The Victoria Hotel, Robin Hood's Bay. Terms, 10/6 per day for bed, breakfast, sandwiches and dinner. Application for rooms should be made to the proprietor without delay as there is a heavy demand for accommodation.

**TRAVEL FACILITIES.**—Long week-end tickets at cheap rates are available at all stations on the L.N.E.R., and enquiries should be made locally. There is a 'bus service from Whitby to Robin Hood's Bay, and from Scarborough to the Bay by changing at Hawsker. Motorists are advised to proceed by way of Hawsker; although Bay Town may be reached by some of the moorland roads the surfaces are bad and the inclines dangerous.

**BOOKS AND MAPS.**—The district to be investigated is included in the 1 in. Ordnance Survey Map (Coloured Edition), No. 16, or Sheet 16 in

the 1 in. Ordnance Survey, Popular Edition. Circulars Nos. 79, 201 and 314 may be consulted. Baker's 'North Yorkshire'; T. Sheppard, 'Geological Rambles in East Yorkshire'; Kendall and Wroot, 'Geology of Yorkshire'; F. Elgee, 'The Driftless Area in North-East Yorkshire and its Relation to the Geographical Distribution of Certain Plants and Animals,' *Naturalist*, 1907; Memoirs of the Geology Survey, 'Whitby and Scarborough District'; Canon R. Fisher, 'Flowering Plants of Whitby and District' (Horne & Son, Whitby, 1/6).

**ROUTES.**—Saturday: Leave Headquarters at 10 a.m. for footpath from Robin Hood's Bay past the gasworks to Fyling Hall (Park Gate), along Ramsdale Beck to Ramsdale Mill; thence across the beck by bridge to its south side, and up to Kirk Moor. Return *via* road to north of Brack Hall, Fyling Hall Station, and road down to the beach at Mill Beck, and by the beach, if tide permits, otherwise along cliffs back to Robin Hood's Bay.

Monday: Leave Headquarters at 10 a.m. for Stoupe Beck, *via* the cliff path; thence past Stoupe Brow Cottage and over the railway to the old alum quarry ('Two Sister' rocks); turn right and follow road past the school to Howdale Beck, keeping along the east side of the Beck to its source on Brow Moor. Return by the west bank, and take the road from Howdale Farm, northwards, crossing Stoupe Beck, returning to the beach at Mill Beck.

Sunday: No definite programme will be arranged for this day until members assemble on Saturday.

High tides at Scarborough (at Robin Hood's Bay about 15 minutes earlier):—Saturday, April 15th, 8-32 a.m., 9-3 p.m.; Sunday, April 16th, 9-37 a.m., 10-14 p.m.; Monday, April 17th, 10-36 a.m., 11-27 p.m. (Summer Time in each case).

**BOTANY.**—Mr. T. Stainforth, B.A., B.Sc., writes: 'Very little seems to have been published about the natural history of the Robin Hood's Bay district as it is in the early part of the year. It will be best to keep as far as possible to the valleys.' Baker's 'North Yorkshire' says little about Robin Hood's Bay, except that the district is not rich botanically. Mr. R. J. Flintoff suggests that the following plants should be looked for:—On the Moors: *Linnæa, Andromeda, Carex pauciflora, Gentiana verna, Genista anglica, Salix repens.* In the woods the aliens *Aconitum napellus* (common below Falling Foss) and *Pyrus torminalis*, and the native *Clinopodium calamintha*, the agrestals *Stachys arvensis* and the alien *Lepidium campestre.* In sandy fields, *Scleranthus annuus*, and in marshy places, *Comarum palustre, Vaccinium oxycoccos, Myrica gale, Eleocharis multicaulis, Osmunda regalis, Menyanthes trifoliata* and *Inula helenium.* On the cliffs, *Beta maritima* and wild cabbage.

**ENTOMOLOGY.**—Mr. G. B. Walsh, B.Sc., writes:—

COLEOPTERA.—The most productive methods of collecting will be searching at the roots of heather, turning stones on the moors, working moorland pools, and sweeping heather. The most likely uncommon species to occur are *Carabus nitens, Miscodera arctica, Bembidion mannerheimi, B. nigricorne, Olisthopus rotundatus, Nebria iberica, Cicindela campestris, Bradycellus cognatus, B. collaris, B. similis, Pterostichus adstrictus, P. lepidus, Calathus micropterus* (usually in rotten wood), *Patrobus excavatus, Cymindis vaporarium.* In the pools, *Rhantus bistriatus, Hydroporus gyllenhalia, obscurus, melanocephalus, melanarius, tristis* and *umbrosus.* By sweeping the heather, *Haltica britten, Ceuth. erica*, and *Lochmaea suturalis.* Under the layers of shale on the shore both species of *Aëpus* and *M. marinum.* The *Gyrinus* on moorland pools is probably *substriatus*, but mixed with it I have recently found in fair numbers ab. *Schatzmajori* Ochs.

LEPIDOPTERA.—It will be too early for moorland and woodland butterflies, but sallows will well repay working, both near the village and in Howgill, *e.g.* for *Pachnobia leucographa.* Sweeping the heather and bilberry

after dark will give larvæ of many species of heath-feeding Lepidoptera, *e.g. Noctua sobrina, N. festiva, Agrotis agathina, Scodiona belgiaria.* Birch trunks should be searched for *Lobophora carpinata* and *Cymatophora flavicornis* ; grass-tufts near *Galium saxatile* for *Larentia multistrigaria,* while beating pines will give larvæ of *Ellopia prosapiaria, Thera variata* and *T. firmata.*

**THE DISTRICT AND ITS GEOLOGY.**—Mr. C. H. Wilson writes : Robin Hood's Bay is considered by many people to be the most picturesque bay on the East Coast of England. It forms an amphitheatre about five miles in diameter, dished, like an enormous bowl, out of the hillside, the top of which, in some places, reaches the 700 ft. contour line. From the brim, looking down the steep sides of the slope, to the sea at the bottom, the prospect is delightful to the nature lover at all times of the year. Most of the land in the immediate district is cultivated, but moorlands invest a great part of the bay. Several deep wooded ravines, with waterfalls, form a very pleasing contrast to the pasture land. The slope on the southern side is somewhat marred by shale dumps, and take one back in time to the days when alum was produced from the Lias strata. Nature has not yet quite healed her wounds. There is also at this spot a quarry, perhaps better described as a clay escarpment, where the fossil-hunter may gain a rich harvest, but, unfortunately, most of his specimens are likely to be incomplete. Geologically the coast is one of the most productive districts in the world, ammonites, belemnites, and bivales predominating. The Geology is best described in Kendall and Wroot's ' Geology of Yorkshire,' and the other publications to which reference is made above should be consulted.

**VERTEBRATE ZOOLOGY.**—Mr. T. N. Roberts writes : Many interesting species of birds may be observed in the district adjacent to Robin Hood's Bay.

On the sea and the cliffs both north and south of the bay may be seen large numbers of Herring Gulls ; the Comorant nests in suitable places at the Peak ; Jackdaws and Rock Doves inhabit the precipitous portions, while an odd Kestrel may be seen. The Fulmar has in recent years established itself as a nesting species and may be seen in large numbers ; to see this bird on the wing is a sight well worth a visit to this part of the coast.

In the woods in the vicinity the Tawny Owl, Green Woodpecker, Ring Dove and Woodcock may be observed as may also the Carrion Crow and Magpie, while one or two pairs of Long-Eared Owls may be found in the fir plantations.

Inland on the Moors may be seen the Wheatear, Curlew, Golden Plover and the Merlin, as may also the Ring Ouzel and the Stone-Chat. The Dipper can be found on all the streams and several pairs of Grey Wagtails are most likely to be found. Lapwings are plentiful on every field, along with many other common species. On some moorland ponds within a few miles may be found a colony of Blackheaded Gulls, where Teal have nested in recent years.

Easter may be early for the summer visitors, but Chiff-Chaff, Willow Wren and others may have arrived.

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**A GENERAL MEETING** will be held at Headquarters on Monday at 6 p.m. for the election of new members, and to received reports from Section Leaders.

Day visitors wishing to take a meal at Headquarters should notify the Proprietor on arrival in the morning. Full particulars of the routes, if different from those scheduled, will be left at Headquarters before starting out each morning.

It is particularly requested that reports of this meeting should be forwarded to the Hon. Secretary without delay.

# YORKSHIRE NATURALISTS' UNION.

For particulars apply to

*The Hon. Secretary, or to The Hon. Treasurer, S. D. Persy Fisher, Sackville Street, Leeds.*

---

**This form, when filled up and signed, should be sent to the Hon. Secretary of the Union, accompanied by the amount of the first year's subscription.**

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*wishes to become a member of the Yorkshire Naturalists' Union, and will subscribe FIFTEEN SHILLINGS (15/-) per annum until the end of the year in which written resignation is given.*

.....
.....
.....
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} [*Signature of Proposer and Seconder.*]

*Elected*.....19 at.....

.....*Chairman's Signature.*

CIRCULAR No. 375.

# Yorkshire Naturalists' Union.

**President:**
JAMES MEIKLE BROWN, B.Sc., F.L.S., F.E.S., Sheffield.

**Local Secretary:**
C. W. MASON, 15 Park Avenue, Hull.

**Hon. Secretary:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

# The 375th Meeting

WILL BE HELD AT

# SKIPWITH

for the investigation of

## Skipwith Common *cum* Riccall Common

## On SATURDAY, MAY 13th, 1933

**TRAVEL FACILITIES.**—Skipwith is best reached by bus from York. The Pullman Bus Service, *via* Thorganby, is as follows:—

| | | a.m. | a.m. | p.m. | p.m. |
|---|---|---|---|---|---|
| York ... | | 9-40 | 10-45 | 12-45 | 2-45 |
| Thorganby | dep. | 10-15 | — | — | — |
| Escrick ... | ,, | — | 11-0 | 1-0 | 3-0 |
| Skipwith ... | ,, | 10-20 | 11-10 | 1-10 | 3-10 |
| | | 10-25 | 11-15 | 1-15 | 3-15 |
| | | p.m. | p.m. | | |
| Skipwith ... | ,, | 5-22 | 7-22 | | |
| Escrick ... | ,, | 5-27 | 7-27 | | |
| Thorganby | ,, | 5-30 | 7-30 | | |
| York ... | arr. | 5-40 | 7-40 | | |

**HEADQUARTERS.**—The Village Hut, Skipwith.

**BOOKS AND MAPS.**—The area to be investigated is included in the 1-in. Ordnance Survey Maps (coloured edition), Nos. 27 and 32, and the same Nos. of the Popular Edition are required to cover the district. For most purposes No. 32, Popular Edition is adequate. Kendall & Wroot's 'Geology of Yorkshire' and J. F. Robinson's 'Flora of the East Riding,' should be consulted. Circulars Nos. 124 and 236 contain much useful information.

**PERMISSION** to visit his estates has been kindly given by Lord Wenlock.

**ROUTES.**—Members will assemble at Headquarters at 11-15 a.m. and will leave for Skipwith Common after the arrival of the bus from York.

Messrs. C. F. Procter and S. H. Smith, F.Z.S., will lead the Vertebrate Zoologists ; Messrs. R. D'Oyley Good, M.A. and T. Stainforth, B.A., B.Sc., will act as guides for the Botany and Entomology Sections.

**THE DISTRICT.**—Mr. S. H. Smith writes :—The village is situated some ten miles South East of York, and three miles from Riccall Station on the L. & N.E.R. main line. The old stone built Church of St. Helen embodies many styles of architecture, early Norman and Perpendicular, and has a Saxon tower. There is some ancient glass and other remains of antiquarian interest. Skipwith Hall is a fine brick-built mansion of Queen Anne period.

The common is an extensive tract of sandy land with a veneer of peat ; much of it in an almost primeval state, well covered with coarse grasses, heather and bracken, with woodland areas chiefly composed of larch, pine trees and birches. The expanse is generally flat and is only a few feet above sea level.

There are numerous marshy places and ponds long famous among naturalists as a happy hunting ground for specimens of their various interests. Near the village some mounds are known as Dane Hills and there are also some tumuli of early British origin. The Rivers Derwent and Ouse are quite near, and both have close association with the mediaeval history of the neighbourhood, Riccall in particular being remembered as the base of the invading armies which culminated in the battle of Stamford Bridge, 1066 A.D. Two miles distant lies East Cottingwith, the birthplace and home of the late Snowden Slights, the well-known old wildfowler whose notes of bird life of the Derwent Valley have been duly recorded in his biography.

**GEOLOGY.**—Mr. J. W. Stather, F.G.S., writes :—The area of this excursion is mapped as Keuper Marls, but very little solid rock can be seen owing to the widespread superficial deposits, consisting of warp, lacustrine clay, sand and gravel. These deposits cover nearly the whole surface between York and the Humber forming the great plain west of the Wolds, which is only broken by the low hills about York, and the morrianic ridge running through Escrick, and the isolated hill of Holme-on-Spalding Moor. This hill which is composed of Keuper Marl, rises out of the flats to a height of 150 feet above sea level, and forms a conspicuous object in the landscape. The gravels which cap the hill are mostly composed of material from the west, while those on its flanks are generally local rocks. The geological interest of this excursion lies in the examination of these gravels, and similar deposits in the area, and the determination of the conditions under which they were deposited.

**VERTEBRATE ZOOLOGY.**—Mr. S. H. Smith supplies the following notes :—The common abounds with all the usual resident and summer visiting birds, and at the date of the excursion even the latest visiting species will have arrived, although it is too early to expect to witness any of their nesting. The chief feature is the colony of Black-Headed Gulls now established for many years. The number fluctuates considerably, probably because of the difficulty of food supply, this causing the gulls to have a wide range over the surrounding district. They also have an adverse effect on the Lapwing whose eggs they take as well as the Lapwing's food. There are generally from four to five hundred Black-Headed Gulls nesting on the ' gull ponds ' although this number is sometimes greatly exceeded.

Numbers of Mallard and Teal Ducks nest on the common and there are a few pairs of Shoveller Ducks and Pochard. Of late years Bitterns have been noted, but so far they have not successfully nested there.

The keeper, Mr. J. Morris, tried to establish Red Grouse on the common, but was unable to carry through the project beyond rearing and turning away the first broods. Grouse do not appear ever to thrive at less altitudes than five hundred feet above sea level.

Redshanks and Snipe nest on the marshy places, and other species which may be seen are Herons, Short Eared Owl (nests sometimes), Long Eared, Tawny, Barn and Little Owl, Nightjar, Turtle Dove, Kestrel and Sparrow Hawks ; Marsh and Hen Harrier have occurred within recent years.

The Nightingale is a rare visitor, while Grasshopper Warblers (rare),

Blackcap and Garden Warblers are summer visitors, also Yellow and Pied Wagtails, Sedge and Reed Warblers nest on the common.

Mammals.—Foxes are encouraged in this area and their staple food —rabbits are quite numerous. Hares are also in evidence, particularly on the surrounding more cultivated lands. A feature of the common is the herd of fallow deer, originally from Escrick Park. They are very shy owing to being repeatedly hunted because of the local depredations on the farms.

Otters frequent the River Derwent near by. The Water Vole is numerous and owing to the marshy nature of the land preventing burrowing, they construct pretty ball-like nests from the pith of ' peeled ' sedges.

Long-Tailed Field Mice, Short-Tailed Vole and Common Shrew are resident species. Grey Squirrels have multiplied enormously, and the Red Squirrel become very rare. Stoats and Weasels are regularly trapped by the keepers, Brown Rats are always numerous, and some years ago a family of pure albino variety of this species were trapped and sent to me, and specimens are in the York Museum.

Reptiles.—Viper and Grass Snakes used to be fairly common, but of late years they have almost disappeared, perhaps as the result of successive periods of wet. The Blind or Slow Worm also occurs and although the date of the excursion is somewhat early, the Common Lizard might be seen.

Amphibia.—The usual species are fairly common.

**ENTOMOLOGY.**—Dr. W. J. Fordham, F.E.S., writes :—

Coleoptera.—The Tiger Beetle (*Cicindela campestris*) is common and search should be made for its parasite *Methoca ichneumonoides* which occurs at Allerthorpe. *Blethisa multipunctata* occurs under felted algae in dried up ponds. Numerous good Water Beetles occur including *Dytiscus circumcinctus, Rhantus grapii, Hydroporus lepidus, striola, tristis, umbrosus, piceus, obscurens, nigrita,* and *melanarius, Agabus unguicularis* and *paludosus, Copelatus agilis* and *Ilybius guttiger.*

Heather roots and sedge refuse produce *Bembidion clarki, Gymnusa brevicollis, Atheta islandica, Agonum gracile, Conosoma pediculariurn* and *Gabrius stipes.* Dung has given the rare *Philonthus atratus* and fungi *Gyrophaena bihamata,* and *Tetratoma fungorum.* Other interesting Beetles are *Aromia moschata* on sallow, *Endomychus coccineus* under bark of birch stumps, *Rhynchites harwoodi* on birch and *Aleochara cuniculorum* in rabbit burrows.

Diptera.—The outstanding Diptera of the common are *Spaniotoma angusta, Prionocera turcica, Oxycera trilineata, Therioplectes distinguendus, Lasiopogon cinctus, Verrallia aucta, Paragus tibialis, Ischyrosyrphus glaucius, Chrysotoxum arcuatum, Echinomyia grossa, Loxocera fulviventris, Urellia stellata* and *Phora fasciata.*

Hymenoptera.—Among the Aculeata may be mentioned *Psen bicolor, Physosceles clavipes, Leptothorax acervorum, Sphecodes pellucidus* and *ferruginatus, Halictus rufitarsis* and *Notozus panzeri.* Sawflies include *Pamphilius vafer, Cimbex femorata, Lophyrus pini. Ento-decta pumilus, Empria excisa* and *Dolerus madidus, nigratus* and *pratensis.*

Ichneumons are *Ichneumon gradarius, Phaeogenes bellicornis, Pimpla arctica, Rhyssa persuasoria, Promethus sulcator, Polyblastus variitarsis* and *Meloboris rufiventris.*

Hemiptera.—Among the noteworthy bugs of the common are *Asopus punctatus, Picromerus bidens, Zicrona coerulea, Acanthosoma interstinctum, Gastrodes ferrugineus, Ceratocombus coleoptratus, Phytocoris pini* and *Camptozygum pinastri.*

Neuroptera (*sensûs lato*).—The Caddis Flies *Phryganea minor* and *Limnophilus flavicornis, bipunctatus, stigma, vittatus* and *luridus* occur, *Raphidia xanthostigma, Chrysopa phyllochroma* and *Nothochrysa capitata* are found, and among the Dragonflies *Sympetrum scoticum, Libellula 4-maculata* and *Lestes sponsa* have been taken.

**MOLLUSCA.**—Mr. H. Sowden writes :—The following species should be found in suitable situations in the district, *Vitrea cellaria, V. alliaria, V. nitidula, V. crystalina, Zonitoidus nitidus, Hygromia hispida, Vallonia*

*pulchella, Cochlicopa lubrica, Carychium mininum, Clausilia bidentata, Vertigo antivertigo, Vitrina pellucida, Euconulus fulvus, Succinea putris.* Among the Fresh Waters pecies, *Limnaea stagnalis, L. palustris, L. glabra, L. truncatula, Pl. albus. Pl. vortex, Pl. fontanus, Pl. crista, Paludestrina Jenkinsi, Valvata piscinalis, Unio pictorum, U. tumidus, Anodonta cygnea, Vivipara vivipara,* may be expected, and a special look-out should be kept in the River Derwent for ' *Vivipara contecta* ' as it would be most interesting if this species should be rediscovered and found still in existence near the district ' Wressle ' where Dr. Martin Lister originally found it, 1678-81. Collectors should always bear in mind that there is ever the possibility of some hitherto unrecorded species turning up to reward the diligent worker.

The following species were obtained in the neighbourhood during August Bank Holiday week-end, 1921 :—In the River Derwent, *Bithinya tentaculata, Neritina fluviatilis, Pisidium amnicum, Sphoerium corneum* and *Limnaea pereger.* From a pond and the dykes in the Ings towards Thorganby were obtained *Planorbis corneus, Pl. spirorbis, Pl. contortus, Pl. umbilicatus, Valvata cristata, Sphaerium corneum, Limnaea pereger, Aplecta hypnorum, Physa fontinalis, Sphaerium lacustre, Pisidium subtruncatum, Pisidium obtusale,* and *Pisidium milium.* The last named was at that time a new record for Yorkshire S.E. vice county area.

On the road side *Helix nemoralis* is to be found in many interesting varietal forms.

**FLOWERING PLANTS.**—Mr. T. Stainforth writes :—The botany of Skipwith and Riccall Commons has been fairly well investigated. The date of the excursion is too early for many of the more interesting and characteristic plants to be flowering. Apart from the common itself, good collecting ground is to be found on the banks of the Ouse between Barlby and Riccall, and in ponds near Barlby on the south-west of Riccall Common. The Line Pits at Skipwith are good.

On the common and its borders the following plants may be found either flowering or in sufficiently recognisable condition :—*Ranunculus sardous, Chelidonium majus, Corydalis claviculata, Fumaria Boraei, Nasturtium palustre, Polygala vulgaris, Erodium cicutarium, Rhamnus Frangula, Ornithopus perpusillus, Potentilla silvestris, procumbens,* and *palustris, Poterium Sanguisorba, Sanguisorba officinalis, Drosera rotundifolia* and *intermedia, Vaccinium Myrtillus, Erica Tetralix,* and *cinerea, Pyrola minor, Hottonia palustris, Samolus Valerandi, Menyanthes trifoliata, Pinguicula vulgaris, Mentha pulegium, Littorella uniflora, Scleranthus annuus, Rumex maritimus, Salix repens,* var. *argentea, Juncus squarrosus* and *effusus* ; the four Lemnas ; *Alisma ranunculoides, Eleocharis multicaulis, Stirpus caespitosus* and *fluitans, Eriophorum vaginatum* and *angustifolium* ; the Carices, *dioica, pulicaris, muricata, echinata, ovalis, panicea* and *flava* ; *Apera Spica-venti, Deschampsia flexuosa, Molinia varia,* and *Nardus stricta.*

In the neighbourhood of the Ouse Bank at Barlby and Riccall have occurred *Aquilegia vulgaris, Thalictrum flavum, Saponaria officinalis, Geranium pratense, Pimpinella major, Allium scorodoprasum, vineale, oleraceum and carinatum, Colchicum autumnale* (now in fruit), *Orchis ustulata* and *Morio, Listera ovata.*

The Rubi recorded for the Skipwith area are *plicatus, carpinifolius, rhamnifolius, pulcherrimus, macrophyllus, leucostachys, mucronatus, Koehleri,* and *dumetorum.*

Ferns, Horsetails, Etc.—The vascular cryptogams recorded include *Lomaria spicant, Asplenium ruta-muraria* (Skipwith Church), *Athyrium Filix-foemina, Lastraea oreopteris* and *Filix-mas, Osmunda regalis, Ophioglossum vulgatum, Botrychium lunaria, Equisetum palustre* and *limosum, Isoetes lacustris* and *Pilularia globulifera.* (It would be interesting to rediscover the two last named).

Algae (Characese).—*Nitella translucens* has been found in ponds at Barlby end of common.

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**A Meat Tea** will be served at Headquarters at 5-45 p.m., at a charge of 2/3 each.

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**A General Meeting** will be held at 6-30 p.m. for the election of new members and to receive reports from Section Leaders.

CIRCULAR No. 376.

# Yorkshire Naturalists' Union.

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**President:**
JAMES MEIKLE BROWN, B.Sc., F.L.S., F.E.S., Sheffield.

**Local Secretary:**
J. HARTSHORN, The Mount, Leyburn.

**Hon. Secretary:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

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# The 376th Meeting

WILL BE HELD AT

# DENT

for the investigation of the neighbourhood including

## Helmside Ghyll, Flinters Ghyll, Colm Scar, Holme Fell and the River Dee

DURING WHITSUN WEEK-END

## SATURDAY, JUNE, 3rd to MONDAY, JUNE, 5th, 1933

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**HEADQUARTERS.**—The George and Dragon Hotel, Dent. Members should apply for accommodation to the Proprietor, Mr. J. Winder. Terms, 9/6 per day for bed, breakfast, sandwiches and dinner.

**TRAVEL FACILITIES.**—The nearest station is Dent. As Headquarters is situated some four miles distant from the station it is desirable to make arrangements with Mr. Winder for the transport of luggage.

**BOOKS AND MAPS.**—1-inch Ordnance Survey Maps (Coloured Ed.), Nos. 19 and 20, cover the area to be investigated. Geol. Survey Maps, 1 in. to mile, Number 97 S.W. (97 N.W., 98 N.E., 98 S.E. are also useful) ; Geol. Survey Memoir on Ingleborough ; ' Geology of Yorkshire,' Kendall and Wroot ; ' West Yorkshire,' Davis and Lees ; ' Flora of West Yorkshire,' Arnold Lees. ' Dentdale and Garsdale ' is the title of a very useful Guide to the district published by F. Riley, The Book Stores, Settle, 1/-. Circulars Nos. 143, 183 and 292 should be consulted. A full account of the Excursion in 1921 will be found in *The Naturalist*, 1921, pp. 273-281.

**THE DISTRICT AND ITS GEOLOGY.**—Mr. J. A. Butterfield, M.Sc., F.G.S., writes :—Dent has a claim to the interest of all geologists, for it was the birthplace of Adam Sedgwick (1785-1873). His father was Vicar of Dent.

The village lies in a beautiful valley drained by the River Dee, flowing westward to join the Rawthey and the Lune. The geological structure is simple but interesting. The valley is cut in the Great Scar Limestone, which extends almost the full length of the dale from Gawthrop to the source. Overlying this is a series of limestones with interbedded sandstones, shales, and impure limestones—the Yoredales. Sections of these are displayed in Oliver Ghyll, Flinters Ghyll, Yellow Ghyll, Deepdale, Cowghyll and Scotherghyll. In the last named a good succession of rocks is exposed, including the Great Scar, Hardraw Scar, and Simonstone Limestones Further afield the surrounding hills carry the succession through the Scar, Undersett, and Main Limestones. Whernside (2414 ft.) to the south, Widdale Fell (2203 ft.) to the east, and Baugh Fell (2216 ft.) to the north, show outlier cappings of Millstone Grit. Throughout the area the beds lie roughly horizontal. The aspect of the country is therefore that of a series of terraces formed by the outcrops of the harder beds of limestones and sandstone, the top of each bed of limestone being generally marked by a row of potholes and the base by a line of springs. Thin coal seams occur between the Main and Undersett Limestones. This coal was originally mined and carried by pack-horse 17 miles for the use of the whitesmiths of Kendal. The Hardraw Scar and Simonstone Limestones have been quarried as ' black marble ' at Dent Head and in Oliver Ghyll.

West of Gawthrop the Carboniferous Limestone is cut out by the Dent Fault, which throws the Great Scar Limestone against beds of Silurian age, consisting of Coniston Flags and Limestone. This fault is displayed in the river bed 200 yards west of Barth Bridge, where the limestone, traversed by cracks infilled with barytes, stands almost vertically. Helmside lies to the west of the fault on these Silurian rocks. In Helmside Ghyll several mica-trap dykes (probable apophyses of the Shap Granite) are to be found. These are of post-Silurian, pre-Carboniferous age.

Glacial drift covers much of the area, and glacial striæ and *roches moutonnees* are to be found on the higher ground.

Two miles east of Dent the river has cut picturesque features in Hell's Cauldron and Black Dub.

**THE EXCURSIONS** will be led by Mr. Chris. A. Cheetham, who writes as follows :—The old-world town of Dent offers much of interest to the archæologist in its houses, traditions and customs. On Saturday we shall take the river side footpaths upstream from Dent bridge ; for a mile and a half the river traverses a flat strath, where it has been confined to its bed by high banks. In some places streams have been carried on high banks to join the river. The whole effort must have entailed a great deal of labour, but the fertile land gained in this way has been well repaid, and to-day cattle from Dentdale fetch the best prices and have the highest reputation for healthiness in the county in spite of the somewhat primitive type of shippon to be found here. Our County veterinary officials have noticed this anomaly. It will be interesting to see how the meadow plants behave on this fertile land. The river and its banks here carry the flora and fauna of an upland valley. Further along the stream runs in a limestone gorge, and the cliffs bear mosses and plants of a different type. At times the river sinks under ground except at flood times, and these dry beds should interest the zoologists.

Flinters Ghyll will repay a scramble up the stream the next morning, and after lunch the road here and on to the Crag will give the moorland plants and animals. On these moors there are some boggy mosses, and at a little tarn the black headed gulls often nest. On Monday the path downstream will be taken to the bridge where the Sedbergh road crosses the river. On the river side the bryologists should try and rediscover G. Stabler's Ash tree, on which grows *Habrodon Notarisii*.

We shall then walk on to Helmside Ghyll, crossing the Dent fault on the way. This is a deep steep-sided cleft in the older Limestone of Silurian age. Here the geologists will find much to interest them, as there are several igneous dykes traversing this Coniston limestone.

Bryologists will be interested in seeing if any mosses have picked out these igneous rocks or the altered rock in contact with them. One of our small feather mosses, *Eurhynchium Teesdalei*. grows on the limestone here. The slippery steep sides may provide a foothold for plants not seen in other parts of the area. The limestone and other Silurian rocks above are fossiliferous. We have very few places in the county on this type of limestone, and the fauna and flora of this ghyll seem to have been neglected.

**LICHENS.**—Mr. W. E. L. Wattam writes :—This class of plants is well represented. Among the species recorded are *Collema furvum* Ach., *Cetraria islandica* Ach., *Alectoria jubata* Nyl., *Physcia obscura* Nyl., *P. Ciliaris* DC., *Lecanora subfusca* Nyl., *Pertusaria lactea* Nyl., *Gyrophora polyphylla* Hook, *G. cylindrica* Ach., *Lecidia lithophila* Ach., *Rhizocarpon geographicum* DC., *Graphis scripta* Ach., *Dermatocarpon lachneum* A. L. Sm., and *Melanotheca gelatinosa* Nyl. Record references are Mr. Albert Wilson's notes in *The Naturalist*, 1922, p. 398, and 1924, pp. 49-50, and my own notes in the same journal for 1921, pp. 276-7, and Y.N.U. Circular No. 143.

**ENTOMOLOGICAL SECTION.**—The Field Meeting of the Plant Galls Committee and other Committees of this Section coincides with this Meeting at Dent and a good attendance is desired ; further details will be announced in *The Naturalist*.

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**A GENERAL MEETING** will be held at Headquarters at 6 p.m. on Monday evening for the election of Members and other general business.

# YORKSHIRE NATURALISTS' UNION.

For particulars apply to

*The Hon. Secretary, or to The Hon. Treasurer, S. D. Persy Fisher, Sackville Street, Leeds.*

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**This form, when filled up and signed, should be sent to the Hon. Secretary of the Union, accompanied by the amount of the first year's subscription.**

**The Subscription of 15/- entitles the members to receive the Union's monthly magazine, "The Naturalist," as well as the "Transactions."**

**Persons related to and resident in the family of a member are admitted as 5/- members, to enable them to attend excursions, but not to receive the publications.**

**Qualification for Life Membership :—A Donation of 11 Guineas.**

## Yorkshire Naturalists' Union.

.....19.....

.....[*Signature and Titles.*]

.....

.....[*Address.*]

*wishes to become a member of the Yorkshire Naturalists' Union, and will subscribe FIFTEEN SHILLINGS (15/-) per annum until the end of the year in which written resignation is given.*

.....
.....
.....
} [*Signature of Proposer and Seconder.*]

*Elected*.....19 *at*.....

.....*Chairman's Signature.*

CIRCULAR No. 377.

# Yorkshire Naturalists' Union.

**President:**
JAMES MEIKLE BROWN, B.Sc., F.L.S., F.E.S., Sheffield.

**Local Secretary:**
Dr. J. GRAINGER, B.Sc., The University, Leeds.

**Hon. Secretary:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

# The 377th Meeting

WILL BE HELD AT

# RIPPONDEN

for the investigation of the

# RYBURN VALLEY

## On SATURDAY, JULY 8th, 1933

**HEADQUARTERS.**—The Derby Inn, Rishworth.

**TRAVEL FACILITIES.**—Suitable trains to Halifax are as follows:—

| | *Huddersfield.* | *Halifax.* |
|---|---|---|
| From Huddersfield for the morning excursion | 8-52 a.m. | 9-18 a.m. |
| ,, ,, ,, afternoon ,, | 12-13 p.m. | 12-46 p.m. |

| | *Leeds.* | *Halifax.* | |
|---|---|---|---|
| From Leeds for the morning excursion | 8-35 a.m. | 9-41 a.m. | (*via* Bfd.) |
| ,, ,, ,, afternoon ,, | 11-45 a.m. | 1-1 p.m. | ,, ,, |
| ,, ,, ,, ,, ,, | 1-2 p.m. | 1-33 p.m. | |

Trains leave Halifax at 6-50 p.m. and 8-18 p.m. for Huddersfield, and at 6-17, 6-34, 7-18 and 8-17 p.m. for Leeds.

Visitors from Huddersfield may also take a 'bus from Catherine Street, Elland (Ripponden and District), starting five minutes to every hour. This, however, is only suitable for the afternoon excursion as it runs straight to Ripponden.

Members may travel to the Triangle by tramcar from Halifax or by 'bus from King Edward Street, Halifax (every 20 minutes, 10 minutes past the hour, etc.). Trams do not run past the Triangle, so visitors for the afternoon excursion should take the 'bus direct to Ripponden.

'Buses run back from the Derby to Halifax 17 minutes past the hour (Ripponden and District) and every hour (North-Western and Yorkshire). From Rishworth there is a 20 minutes' service.

**ROUTES.**—The morning party will meet at 10 a.m. at the Triangle tram terminus. Under the leadership of Mr. E. Hallowell they will walk along the road for some distance and then spend some time on the right bank of the river, working up-stream towards Ripponden. They will join the afternoon party after lunch.

The afternoon party will meet at 2 p.m. at Ripponden 'Bus stop (at the junction of the Manchester and Rochdale roads). Mr. J. H. Priestley will lead the party up Turner Clough and over the moors to the Derby, where tea may be obtained. (Ham and egg teas 2/6 ; beef and boiled ham teas 1/9 ; plain teas 10d.)

**MEETING.**—A General Meeting will be held at Headquarters at 6 p.m. for the election of members and other business.

**BOOKS AND MAPS.**—Mr. J. H. Lumb, Secretary of the Halifax Scientific Society, sends the following list of books on the district :—' The Halifax Naturalist ' (Crump and Crossland), ' The Flora of Halifax ' (Crump and Crossland), ' West Yorkshire ' (Davis and Lees), ' Flora of West Yorkshire ' (Lees), ' Botanical Map of Leeds and Halifax District ' (Smith and Moss), ' The Country around Hudderfield and Halifax ' (Geological Survey). Mr. J. H. Priestley has written a ' History of Ripponden.'

Sheet No. 77 of the Ordnance Survey and the same Sheet No. of the Geological Survey Map portray the district.

**THE DISTRICT.**—Mr. J. H. Priestley writes :—The Ryburn Valley, embedded in the heart of the Pennines, is without doubt one of the prettiest valleys in the West Riding. Ryburn, Rybourne, Ribbonden or Ripponden has a very ancient history written in stone and flood. Rhy is British for a ford, bourne is a river, and dean, dene, or den is a Teutonic word for a deep, wooded valley. The gateway to the valley is at Sowerby Bridge, where the Ryburn loses itself into the Calder. The road was one of the earliest turnpikes in the country and runs between an avenue of beech, birch, elm and sycamore, with not a few limes.

Ripponden, a little over a hundred years ago, was the cluster of houses round the church, which was said to be the fifth building. The old Waterloo Bridge is interesting, though we cannot say when it was built. Over it, however, went Daniel Defoe on his way to Halifax, after crossing Blackstone Edge.

An interesting walk leads along Ox Grains river till it buries itself in Turner Woods. Then one may mount the hillside and gain some remarkable sights of the woods and ravine, or turn by Rishworth Mills, once the site of many small water wheels and corn mills owned by John Wheelwright.

Pike End Hill, 1080 ft. high, refuses to be unnoticed, and as we turn down the slope by Cockroft, a typical sixteenth century farmhouse, Manshead towers in the distance, 1368 ft.

**GEOLOGY.**—Mr. C. J. Spencer writes :—Many of the western tributaries of the Calder seem to run in lengthy zig-zags with more or less right-angled bends. The Ryburn is a fairly typical example of this feature in the broad outlines of its course. The whole valley is carved out of the Millstone

Grits. The Ladstone, a prominent weathered escarpment of Rough Rock, is on the eastern side from Triangle, while on the west, the summit of Crow Hill (1258 ft.) is capped by the flags found at the base of the Rough Rock. Coming down the hillsides the four grit bands formerly grouped together as the third Grits, but now known by the specific titles applied by the recent re-Survey, are exposed in various parts of the valley. Above Ripponden the Kinderscout Grit appears and becomes prominent up on the moors. Several faults cross the valley—one just on the north (or Triangle) side of Ripponden Church and one just north of Triangle station, well displayed in the railway cutting. Fossils are not frequently found. The moors, particularly Ringstone Edge and parts of Blackstone Edge, have yielded numerous flint implements and chippings to the collections of Mr. Barratt, Mr. Priestley and others.

**BIRDS.**—Mr. H. Thornton writes :—In and around Ripponden, in the woods, may be seen the Wood Warbler, Spotted Flycatcher, Stock Dove, Wood Pigeon, Greater Spotted Woodpecker, Sparrow Hawk, Kestrel, Tawny Owl and occasionally the Long-eared Owl. On the moorlands above, the following nest each year :—Dunlin, Golden Plover, Redshank, Mallard, and about five miles distant is a colony of Black-headed gulls.

Within easy distance of Ripponden are also Merlin, Twite, Ring Ouzel, Dipper and Grey Wagtail which all nest regularly, and in 1932 three pairs of Short-eared Owl nested, each in close proximity to nesting Merlin.

**FLOWERING PLANTS.**—Mr. E. Hallowell gives the following list of trees which may be found on the park land between Triangle and Ripponden. (Morning excursion).—Variegated Maple (possibly a periclinal chimæra), Hornbeam, Norwegian Maple, London Plane and *Pyrus aria*. Many interesting flowering plants are found in the bogs on the right bank of the stream, and *Myrica Gale* is found on the moors.

The river banks offer the usual flowering plants of industrial valleys. At Rishworth occurs *Convallaria majalis*, which, however, will not be in flower.

There used to be two stations for *Trollius europæus*, but I believe one of them has been destroyed in the new waterworks excavations. A remarkable addition to our flora was made some years ago by the appearance high up the Ryburn Valley of *Claytonia siberica*. This plant now occupies considerable ground for many miles down the Ryburn and Lower Calder Valleys, and may be seen in many cottage gardens.

**MOSSES AND LIVERWORTS.**—Mr. E. Hallowell gives the following lists as being typical :—Mosses : *Webera nutans* Hedw., *Ceratodon purpureus* Brid., *Bryum argentum* L., *Barbula rubella* Mitt., *B. Convoluta* Hedw., *Fissidens bryoides* Hedw., *Tortula muralis* Hedw. Liverworts : *Gymnocolea inflata* H., *Lophocolea bidentata* L., *Lophozia floerkii* Weber et Mohr., and *Conocephalus conicus*.

**LICHENS.**—Mr. W. E. L. Wattam writes :—The impure atmosphere is responsible for only the hardiest species continuing to exist. Amongst those which may be expected to be met with are *Evernia furfuracea* Mann., *Cetraria glauca* Ach., *Parmelia physodes* Ach., *P. fuliginosa* Nyl., *P. omphalodes* Ach., *Xanthoria parietina* Th. Fr., *Candelariella vitellina* Mull-Arg., *Lecnanora muralis* Schaer., *L. varia* Ach., *L. conizæa* Nyl., *L. galactina* Ach., *L. polytropa* Schaer., *Cladonia gracilis* Willd., *C. coccifera* Willd., *Lecidia granulosa* Schaer., *L. contigua* Fr., and *Bilimbia sabuletorum* B. and R.

**ECOLOGY.**—Dr. T. W. Woodhead writes :—Ripponden is in a typical Millstone Grit Valley, the River Ryeburn has cut deeply through a succession of sandstones and shales from the Rough Rock, through the Middle Grits down to the Kinderscout Grit in the bed of the stream. The outcrops of

sandstone give a step-like character to the sides of the narrow valley which is freely planted with sycamore, elm, beech and horse-chestnut. After leaving Sowerby Bridge the lower part of the valley through Triangle and Ripponden is park-like in character with many fine trees. The slopes above retain traces of primitive woodland of oak and birch, with heath plants and much bracken in the ground flora.

From Rishworth to Cunning Corner the trees become stunted and the lower parts of the narrowing valley are occupied by oak-birch scrub and small plantations of beech, sycamore and scots pine. The pastures of the upland slopes are divided by low blackened sandstone walls. To meet the needs of West Riding towns for increased water supply and to reduce the chances of pollution, these upland farms are becoming vacated and derelict and the vegetation is reverting to grass-heath with *Nardus* as the dominant grass. The springs are marked by rush-beds, and bracken covers extensive parts of the slopes up to the higher springs. Beyond the Derby Inn are fine examples of *Molinia* moor and this gives place to bilberry on the edges and finally cottongrass on the peat-covered summit where the mean annual rainfall is 50 to 55 inches. On the flatter stretches, *Eriophorum augustifolium* covers large areas but on the plateau the dominant plant is *E. vaginatum* which is still the chief peat former over a wide area. Here one gets a good idea of the extent of the cottongrass moss of the Southern Pennines. On the better drained parts of Moss Moor and Weystone Moor there is much bilberry, cowberry and crowberry and grey-green patches of cloudberry, and in the small sphagnum bogs is the cranberry.

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# YORKSHIRE NATURALISTS' UNION.

For particulars apply to

*The Hon. Secretary, 29 Frankland Terrace, Leeds; or to the Hon. Treasurer, S. D. Persy Fisher, Sackville Street, Leeds.*

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.....[*Signature and Titles.*]

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.....[*Address.*]

*wishes to become a member of the Yorkshire Naturalists' Union, and will subscribe FIFTEEN SHILLINGS (15/-) per annum until the end of the year in which written resignation is given.*

**Members are entitled to receive 'The Naturalist' and all other current publications of the Union, free.**

.....
.....
[*Signature of Proposer and Seconder.*]

CIRCULAR No. 378.

# Yorkshire Naturalists' Union.

**President:**
JAMES MEIKLE BROWN, B.Sc., F.L.S., F.R.E.S., Sheffield.

**Local Secretary:**
RILEY FORTUNE, F.Z.S., 8 Westcliffe Terrace, Harrogate.

**Hon. Secretary:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

## The 378th Meeting

WILL BE HELD AT

# RIPON

for the investigation of the

## VALLEYS OF SKELL AND LAVER

During Bank-Holiday Week-end

## SATURDAY, AUGUST 5th to MONDAY, AUGUST 7th, 1933

**HEADQUARTERS.**—Unicorn Hotel, Market Place, Ripon. Terms: bed and breakfast, 8/6, full daily tariff, 12/-. Members intending to attend should write immediately as there is a heavy demand on accommodation in Ripon.

**TRAVEL FACILITIES.**—There are frequent trains and a good bus service from Leeds, Bradford, Harrogate, etc. These are likely to be busy owing to the Races and members should make certain of their booking previous to the date of travel.

**PERMISSION** to visit their estates has been given by Sir Wm. Aykroyd, Bart., Sir J. Barran, Mr. Viner and the Ripon Corporation.

**MAPS AND BOOKS.**—Maps Nos. 20 and 21 of either the 1-in. Ordnance Survey (Coloured Edition) or of the Popular Edition are required for the district to be investigated. Kendall & Wroot's 'Geology of Yorkshire,' Lee's 'Flora of West Yorkshire' should be consulted. Circulars Nos. 122 and 186 contain much information relating to the districts to be visited.

**ROUTES.—Saturday,** Leave Headquarters at 10 a.m. for the Upper Valley of the Skell to Grantley, Eavstone Lake and Lumley Moor Reservoir.

**Sunday.** To Sawley, Pickingill and Brimham Rocks, leaving Headquarters at 10 a.m.

**Monday,** 10 a.m. To Aldfield for Spa Gill Woods, Fountains and Studley Park, returning via Mackershaw Woods to Ripon.

These excursions require a journey by bus at the outset and the arrangements for this service can only be made after assembling for the week-end.

**BOTANY.**—The district is interesting botanically and in 1905 Mr. B. M. Smith wrote :—The Skell valley is a delightful botanist's paradise. Formed by two streamlets, one running from Hungate, the other from the moors between Grantley and Pateley Bridge, the Skell enters the park at Grantley. Opposite the Hall is a huge hill which for long defied all efforts to clothe it with verdure, until a shot gun was charged with various seeds and the desired verdant bank secured. Leaving Grantley Hall, the Skell runs into Aldfield Wood and Spa Gill. A mild sulphur water from this part has lately been conveyed to Ripon, and visions of an inland watering place are occupying the minds of the civic authorities. Numerous ferns and flowers abound, both *Chryospleniums*, *Paris quadrifolia*, several shield ferns, and in the boggy land near Spa House, many marsh plants. In Aldfield Wood have been found the Oak, Beech, Lemon scented, Broad Shield, Prickly Shield, and Hart's tongue (crested variety) Ferns, while *Epipactis latifolia* and *E. palustris* are sometimes fairly abundant. Entering the grounds of Fountains Abbey the botanist should see several wall-loving ferns, *Mimulus*, water lily (yellow), daffodil, etc. A few plants of *Atropa belladonna* have been carefully preserved by Lord Ripon for many years in a secluded spot away from the public eye. A few years ago the water soldier and white water lily were planted in the ponds opposite the Temple of Piety as the results of a Y.N.U. excursion, but I don't know if they still grow there. It is a place where many rareties have been found at one time or another. In the Mackershaw Woods the lily-of-the-valley may be found, while in the pastures beyond, Moonwort, Adder's tongue, and Bird's nest, *Neottia*, have been found. On Whitcliffe the spindle tree grows, while on Redbank *Gagea lutea* revels. Nothing of much note occurs as the river winds its way through the city, ultimately emptying itself into the Ure at Fishergreen.

The following have been recorded :—*Thalictrum minus* and *T. flavum*, *Adonis*, *Trollus*, *Helleborus viridis*, *Aconitum napellus*, *Actaea spicata*, *Chelidonium majus*, *Corydalis claviculata*, *Reseda lutea* and *luteola*, *Ononis arvensis*, *Spiræea ulmaria* and *S. filipendula*, *Potentilla Comarum*, *Parnassia palustris*, *Drosera rotundifolia*, *Monotropa Hypopitys*, *Hottonia palustris*, *Pinguicula vulgaris*, *Anchusa sempervirens*, *Hyoscyamus niger*, *Ophrys apifera, and O. muscifera.*

The late Dr. Wm. G. Smith wrote :—The trees of Studley Park are worthy of attention. One may find here good examples of almost all the woodland trees grown in Britain, Old Chestnut, Oak, Ash, Spruce, Hemlock, Fir, Scots Pine, etc. The route is well suited for observations on botanical survey.

The whole district will repay examination of its flora in departments of cryptogamic botany.

**VERTEBRATE ZOOLOGY.**—Mr. Riley Fortune writes :—The district to be visited is exceedingly rich in bird life. Most of our smaller songsters are abundant. In the woodlands all the British Owls, with the exception of the Short-eared (which is occasionally seen on the moors), are fairly plentiful. The Barn Owl nests regularly among the ruins of the Abbey. Woodpeckers are fairly common and the Nuthatch has one of its few Yorkshire habitations here. This bird becomes very tame, so much so that it occasionally comes to the tea tables with the Chaffinches, etc., in the grounds of Fountains. On the Moorlands, Grouse, Curlew, Redshanks, Snipe and Ring Ouzels regularly nest. By the river side may be seen Dippers, Sandpipers and Grey Wagtails. The Yellow Wagtail also nests in the district. Game being strictly preserved, birds of the Hawk family are kept rigorously within bounds, nevertheless both the Kestrel and Sparrowhawk manage to rear a few broods, and the Merlin, at rate intervals, attempts to nest.

All the most familiar mammals are to be met with, including both the Otter and Badger. A small cave, Ned Hole, in the vicinity of Eavstone Lake, was formerly the only known Yorkshire habitat of the Lesser Horseshoe Bat ; unfortunately, the greed of collectors and other causes have contributed to its, I am afraid, total extermination.

Very fine herds of both Red Deer and Fallow Deer are to be seen at Studley, though, I regret to say, in smaller numbers than formerly.

In the streams and lakes trout are abundant and grow to large size in the lakes. Very large Grayling are caught in the Skell. Minnows, Gudgeon, Loach, Roach and Bull-heads are common in some parts, and although not coming under the list of Vertebrates, it is worthy of note that the Crayfish is found in the district.

Adders are fairly common on the Moorlands and waste grounds, and also the Common Lizard. Whilst in the more fertile spots both the Grass Snake and the Slow Worm can be seen.

**ENTOMOLOGY.**—Mr. A. E. Winter writes :—The well-wooded district will well repay the Coleopterist a visit, but, owing to the warm summer this year, he may find August not too promising owing to an early season.

The following are a few of the less common species the writer has found in the district :—Wasps' nests are productive in this district, the following Beetles having been taken :—*Aleochara spadicea*, *Quedius ochripennis*, and the interesting *Metoechus paradoxus*. *Silpha tyrolensis* var. *nigrita* in carcases ; *Triplax aenea*, *Tetratoma fungorum* and *T. ancora* in fungi on fir stumps ; *Elater balteatus* and *Melanotus rufipes* in rotten fir stumps ; of the *Longicornia*, *Stenostola ferrea* may be found occasionally. *Chrysomela orichalcea* var. *Hobsoni* occasionally by sweeping. The most interesting *Rhynchophora* are probably :—*Rhynchites pubescens* on Hazel, not uncommon in July, and *Rhinomacer attelaboides* on Scotch fir in the Studley district.

**A Meat Tea** may be obtained on Monday at Headquarters at a charge of 2/6 per head, and will be served at 5-30 p.m.

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**A General Meeting** will be held at 6-30 p.m.

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**FRESH-WATER BIOLOGY COMMITTEE.**—The Annual Meeting of this Committee will be held at Headquarters during the week-end. Ripon is a good centre for investigation and a good attendance is requested by the Convenor, Mr. C. Allen, 27 Grosvenor Terrace, York.

# YORKSHIRE NATURALISTS' UNION.

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---

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**Persons related to and resident in the family of a member are admitted as 5/- members, to enable them to attend excursions, but not to receive the publications.**

**Qualification for Life Membership :—A Donation of 11 Guineas.**

## Yorkshire Naturalists' Union.

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*wishes to become a member of the Yorkshire Naturalists' Union, and will subscribe FIFTEEN SHILLINGS (15/-) per annum until the end of the year in which written resignation is given.*

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.....
.....
} [*Signature of Proposer and Seconder.*]

*Elected*.....19 *at*.....

.....*Chairman's Signature.*

CIRCULAR No. 379.

# Yorkshire Naturalists' Union.

**President:**
JAMES MEIKLE BROWN, B.Sc., F.L.S., F.R.E.S., Sheffield.

**Hon. Secretary:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

## The 379th Meeting

WILL BE

## THE ANNUAL FUNGUS FORAY
OF THE
## MYCOLOGICAL COMMITTEE
AT
# BARNARD CASTLE

for the investigation of

Baldersdale, Deepdale, Pecknell Wood, Lartington Park and Wood, Thorsgill, Rokeby Park, Brignall Banks and Barningham Park.

## From Saturday, September 16th to Thursday, September 21st, 1933

*Chairman of the Mycological Committee*:
Mr. A. E. PECK, Scarborough.

*Hon. Secretary and Convener*:
Dr. J. GRAINGER, Tolson Memorial Museum, Huddersfield.

*Recorder*: Mr. F. A. MASON, Leeds.

**HEADQUARTERS.**—Station Hotel, Barnard Castle. Terms 7/6 per day for bed, breakfast, sandwiches and dinner. Members

should write the Proprietor, Mr. Robert Brown, stating their requirements without delay. The accommodation consists largely of double-bedded rooms, and when writing applicants should state if they are willing to share a room.

**PERMISSION** to visit parts of the district has been kindly granted by the Earl of Strathmore, Sir Fredk. Milbank, Bart., Major H. E. Morritt, and Norman Field, Esq.

**EXCURSIONS.**—On Saturday, Pecknell Wood and Larlington Park and Woods will be visited. Lartington may be reached by 'bus or train, and times of departure will be announced at headquarters. The Mycological Committee will be joined by members of the Darlington and Teesdale Naturalists' Field Club, and arrangements will be made for an afternoon party to meet the main party. Lartington Hall Wood will be first examined ; then the Scur Beck through the park and along the narrow strip of Pecknell Wood, mostly felled, to its junction with the Tees. From there, two or three fields of riverside lead back to Barnard Castle for tea.

On Sunday afternoon, Rokeby Park and Mortham Wood will be visited. Tea at Rokeby Cafe.

In addition, excursions will be arranged, as convenient, to the following places : Baldersdale, Deepdale, Brignall Banks, Barningham Park, and Thorsgill.

**GUIDES.**—Mr. J. B. Nicholson, M.A., Secretary of the Darlington and Teesdale Naturalists' Field Club, and Mr. M. S. Welsh, of Barnard Castle, will act as guides for the various excursions.

**MEETING.**—The Annual Meeting of the Committee will be held at headquarters on Saturday evening, September 16th, at 8 p.m.

**LECTURES.**—The Chairman's Address will take the form of a public lecture entitled ' Edible and Poisonous Mushrooms,' illustrated by lantern slides, and will be delivered in the School House, on Monday evening, Sept. 18th, at 8 p.m.

On Tuesday evening, Mr. T. Petch, B.A., B.Sc., will speak on ' Some Reminiscences of a Government Mycologist.'

**SPECIAL WORK.**—Members are particularly requested to bring books and microscopes, and as it is felt that it would be highly desirable to extend our knowledge of the larger Ascomycetes and their classification, Mr. T. Petch and Mr. F. A. Mason will deliver short informal talks on methods of investigation, etc. It is thought that this might form the basis for an intensive study of the group by members of the Committee. The convener will be glad to receive particulars of any notes or subject for discussion which members might like to bring up at the meeting.

CIRCULAR No. 380.

# Yorkshire Naturalists' Union.

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JAMES MEIKLE BROWN, B.Sc., F.L.S., F.R.E.S., Sheffield.

**Hon. Secretary:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

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A. H. PAWSON, J.P., F.L.S., F.G.S., London.
W. EAGLE CLARKE, LL.D., F.R.S.E., Edinburgh.
PROF. A. C. SEWARD, M.A., F.R.S., Cambridge.
ALFRED HARKER, M.A., F.R.S., Cambridge.
THOMAS SHEPPARD, M.Sc., F.G.S., F.S.A.Scot., Hull.
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HERBERT E. WROOT, Leeds.
T. PETCH, B.A., B.Sc., North Wootton, King's Lynn.
PROF. A. GILLIGAN, D.Sc., F.G.S., M.I.M.E., Leeds.

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# The 380th Meeting

## and 72nd Annual Meeting

WILL BE HELD AT

# LEEDS

## On Saturday, December 9th, 1933

By the courtesy of the Council of the University of Leeds, the Meetings will be held in the Botany and Zoology Departments at the University, University Road, Leeds, on the joint invitation of :—

The Leeds Co-operative Naturalists' Field Club ;
The Leeds Geological Association ;
The Leeds Naturalists' Club and Scientific Association ; and
The Yorkshire Conchological Society.

**TRAVEL FACILITIES.**—Good train services from all over the county and excellent bus services from every part of the West Riding make Leeds a readily accessible centre for this meeting. Intending visitors should enquire at their local stations for particulars of cheap bookings. The following are times of departure of trains from Leeds to the various larger towns :—

Barnsley, 7-25 p.m. and 9-15 p.m.
Bradford, *via* Shipley, 8-10 p.m., all stations, 9-5 p.m.
*via* Stanningley, all stations, 8-12 p.m., 9-0 p.m.
Darlington, 8-0 p.m.
Halifax, 7-20 p.m., 8-48 p.m.
Huddersfield, 8-0 p.m., 8-48 p.m., 9-10 p.m.
Hull, 8-0 p.m.
Manchester (Victoria), 7-15 p.m., 8-48 p.m. ; (Exchange), 7-30 p.m.
Sheffield, 7-10 p.m., 8-55 p.m.
York, 8-45 p.m., 9-15 p.m.

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# PROGRAMME.

2-0 p.m. **Sectional and Committee Meetings.** This affords an opportunity for Conveners of Committees to bring forward business or complete election of officers where necessary before the General Committee Meeting. (Room 29).

2-30 p.m. **Executive Meeting.** (Botany Museum, behind Large Lecture Theatre, Room 18).

3-0 p.m. **A General Committee Meeting** will be held in the Large Lecture Theatre, (Room 18).

Executive Officers, Permanent Members of Committee, and Delegates of Affiliated Societies are requested to attend to consider the Annual Report, elect officers and arrange Excursions for 1934.

4-45 p.m. Tea will be served in the University Refectory. A meat tea will be provided at a charge of 1/9 per head, and plain teas may be had at proportionate charges.

6-0 p.m. **Annual Meeting**, at which the President

Mr. J. M. Brown, B.Sc., F.L.S., F.R.E.S.,
will deliver his Presidential Address, entitled,

"THE ANIMAL BIOLOGY OF UPLAND STREAMS,"
which will be illustrated by lantern slides.
(In the Large Lecture Theatre).

7-15 p.m. **Conversazione**, on the invitation of the four Local Scientific Societies named above, during which refreshments will be provided in the Zoology Laboratory.

Exhibits have been arranged by the respective Societies as follows :—

Leeds Co-operative Naturalists' Club :

The Local Alien Flora.
Ornithological Photographs.

Leeds Geological Association.

Specimens illustrative of Local Geology.

Leeds Naturalists' Club and Scientific Association :

Alien plants from Olympia Oil & Cake Mills.
Yorkshire species of Carex.
Some Yorkshire Mosses and Marine Algæ.
Some Interesting Yorkshire Insects.
Recent Entomological Literature.
Bromeliad inhabiting Dragonflies.
Some specialised Insect types.

These exhibits will be found in the Laboratories situated on the top floor of the Departments.

Leeds Naturalists' Club and Leeds Co-operative Naturalists' Field Club :

An Exhibition of Mycological photographs and specimens.

Yorkshire Conchological Society :

Local Land and Freshwater Mollusca and the Helicidiæ ; Yorkshire Marine Mollusca. (In the Zoology Laboratory.)

Further exhibits will be arranged in the Botany Department by Prof. J. H. Priestley, and in the Zoology Department by Prof. E. A. Spaul.

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.....[*Signature of Proposer and Seconder.*]

.....

*Elected*.....19 *at*.....

.....*Chairman's Signature.*

# NEW YORKSHIRE BOOKS

## WINESTEAD AND ITS LORDS

The History of a Holderness Village. By NORMAN JAMES MILLER. M.A., Rector of Winestead, 1890-1920. With a Foreword by THE ARCHBISHOP OF YORK. 258 pages, demy 8vo, 9 plates and 5 illustrations, quarter-bound cloth. 10/- net, or post-free, 10/6.

"Parish history is a notable aid to the cultivation of a keen national spirit. An excellent example is 'Winestead and its Lords,' by the late Canon N. J. Miller. The old church there is a shrine of English history, and the Rector holds his Rectory with house and glebe in unbroken succession from the appointment of Nicholas Maleth in 1237. Every phase of the making of England is illustrated in this chronicle of a quiet corner in 'the mersshy contree called Holdernesse,' as Chaucer describes it. Winestead was the birthplace of Andrew Marvell, and in his poems he recalls the lowly parsonage in which he was born."—*Morning Post.*

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## PLACE-NAMES OF THE EAST RIDING OF YORKSHIRE

By JOHN NICHOLSON. 137 pages, demy 8vo, being a reprint from *The Transactions of the East Riding Antiquarian Society.* In paper covers, 5/- net, or in cloth boards, gilt, 7/6 net.

For many years this author has had the reputation of being our greatest authority on East Yorkshire folklore. He has had exceptional opportunities of investigating rare sources of information, regarding the question of the various puzzling place names occurring in the East Riding of Yorkshire. At the present time there seems to be a distinct revival of interest in this subject, and it is felt that many would like to have a work dealing with it, in a cheap and readily accessible form.

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